



KINE 4p84
Library Seminar
Winter 2024 term

Ian Gordon



Ian Gordon, Teaching & Learning Librarian



Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

Assignments Guideline

If you have any questions regarding any of the items or guidelines below, make sure you inquire with the instructor in advance of completion (the sooner the better).

a. **Library resource modules completion (5%) Due Feb. 5th**

Students will be required to complete several modules online (through Brightspace), which will involve an interactive presentation (online) and online completion of several questions per module. Specific instructions will be provided within the modules online.

b. **Group presentation (10+15=25%)**

In groups of 2-3 students (depending on enrollment):

- i. Pick a pediatric clinical condition or disease (see list of examples below)
- ii. Presentation and discussion (Q&A)
Part 1 (10%): Background of specific condition + expected challenge/role posed by exercise/training
Part 2 (15%): Response to exercise and training (see guidelines below).
Presentation slides to be submitted via Brightspace – by **Mar. 24th**
- iii. Describe your role in the group project (1 paragraph). To be submitted on the **day of presentation**. (5% deduction if not submitted)
- iv. Complete peer evaluation. To be submitted on **last day of course** (5% deduction if not submitted)

c. **Written presentations assessment (10%)**

Students will be required to

- i. Submit two questions for discussion for each presentation. To be submitted on the **day of presentations**.
- ii. Review and assess all presentations, using a standardized rubric (see end of document). To be submitted on the **day of presentation**.

Group presentation on a specific clinical condition or disease and its implications for exercise response, performance and training.

- Pick a pediatric clinical condition or disease.
- Provide background of specific condition/disease.
- Expected challenge/role posed by exercise/training.
- Response to exercise/training.

Examples of clinical conditions or diseases:

- Asthma
- Cystic fibrosis
- Obesity
- Anorexia/malnutrition
- Diabetes – type I
- Diabetes – type II
- Muscular dystrophy
- Cerebral palsy
- Hemophilia
- Congenital heart defect
- Juvenile arthritis
- Growth hormone deficiency
- Epilepsy
- Spina bifida
- Scoliosis
- Cancer
- Inflammatory disease
- Chronic renal disease
- Mental health
- ADHD

What are the challenges faced by practitioners treating children with asthma by exercise?

Using PubMed to find empirical papers that include original data from scholarly peer-reviewed journals.

<https://brocku.ca/library/video-tutorials/>

IN THIS SECTION

CHAT ONLINE

VISIT THE ASK US DESK

BOOK A CONSULTATION

ATTEND A WORKSHOP

> WATCH A VIDEO TUTORIAL

USE A RESEARCH GUIDE

FIND CITATION HELP

SYSTEMATIC REVIEWS & EVIDENCE SYNTHESSES

MAKERSPACE SUPPORT

DSL TOOLS & TUTORIALS

DATA, GIS & MAP SUPPORT

Connect with us



Video Tutorials

If you need a quick point in the right direction, then you're in the right place. Learn at your own pace with our selection of mini video tutorials (2-3mins) covering library resources and search strategies.

What's an Annotated Bibliography?



What are Primary & Secondary Sources



What's a Search Strategy?



What are "Scholarly" Sources?



What does "Peer Review" Mean?



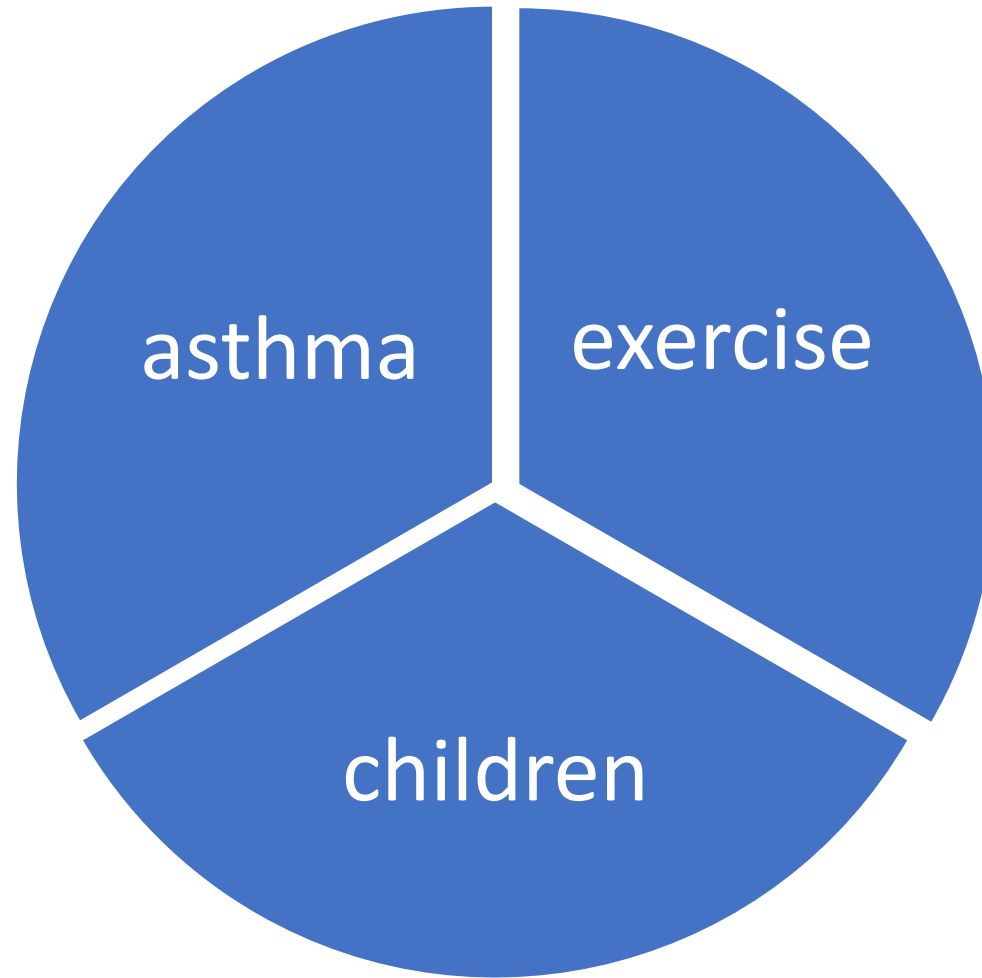
Evaluating Sources with RADAR



[Browse all videos](#)

What are the challenges faced by practitioners
treating children with asthma by exercise?

What are the challenges faced by practitioners treating children with asthma by exercise?



What are the challenges faced by practitioners
treating children with asthma by exercise?

P children

I exercise

C asthma

O healthy

1. [child* age 6-12, MeSH “child”; PsycINFO 6-12, “school age”; Education Source & Sport Discus, age 0-12, “children”] or “elementary school children” ...
2. exercise* or perform* or train* or respon* or “physical fitness” or physio*or rehabil*...
3. asthma* ~~Asperger Syndrome~~

challeng* or barrier* or role or roles or outcome* or treatment* or intervention* or approach* or behav*...

<https://www.ncbi.nlm.nih.gov/mesh>

Asthma

A form of bronchial disorder with three distinct components: airway hyper-responsiveness (RESPIRATORY HYPERSENSITIVITY), airway INFLAMMATION, and intermittent AIRWAY OBSTRUCTION. It is characterized by spasmodic contraction of airway smooth muscle, WHEEZING, and dyspnea (DYSPPNEA, PAROXYSMAL).

PubMed search builder options

[Subheadings:](#)

- | | | |
|--|---------------------------------------|---|
| ☐ blood | ☐ enzymology | ☐ pathology |
| ☐ cerebrospinal fluid | ☐ epidemiology | ☐ physiopathology |
| ☐ chemically induced | ☐ ethnology | ☐ prevention and control |
| ☐ classification | ☐ etiology | ☐ psychology |
| ☐ complications | ☐ genetics | ☐ radiotherapy |
| ☐ congenital | ☐ history | ☐ rehabilitation |
| ☐ diagnosis | ☐ immunology | ☐ surgery |
| ☐ diagnostic imaging | ☐ metabolism | ☐ therapy |
| ☐ diet therapy | ☐ microbiology | ☐ urine |
| ☐ drug therapy | ☐ mortality | ☐ veterinary |
| ☐ economics | ☐ nursing | ☐ virology |
| ☐ embryology | ☐ parasitology | |

☐ Restrict to MeSH Major Topic.

☐ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C08.127.108, C08.381.495.108, C08.674.095, C20.543.480.680.095

MeSH Unique ID: D001249

Entry Terms:

- Asthmas
- Bronchial Asthma
- Asthma, Bronchial

See Also:

- [Anti-Asthmatic Agents](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Respiratory Tract Diseases](#)

[Bronchial Diseases](#)

Asthma

[Asthma-Chronic Obstructive Pulmonary Disease Overlap Syndrome](#)

[Asthma, Aspirin-Induced](#)

[Asthma, Exercise-Induced](#)

[Asthma, Occupational](#)

[Cough-Variant Asthma](#)

[Status Asthmaticus](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Respiratory Tract Diseases](#)

[Lung Diseases](#)

[Lung Diseases, Obstructive](#)

Asthma

[Asthma-Chronic Obstructive Pulmonary Disease Overlap Syndrome](#)

[Cough-Variant Asthma](#)

Exercise

Physical activity which is usually regular and done with the intention of improving or maintaining PHYSICAL FITNESS or HEALTH. Contrast with PHYSICAL EXERTION which is concerned largely with the physiologic and metabolic response to energy expenditure.

Year introduced: 1989

PubMed search builder options

Subheadings:

☐ adverse effects

☐ classification

☐ genetics

☐ history

☐ immunology

☐ physiology

☐ psychology

☐ standards

☐ statistics and numerical data

☐ trends

☐ Restrict to MeSH Major Topic.

☐ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): G11.427.410.698.277, I03.350

MeSH Unique ID: D015444

Entry Terms:

- Exercises
- Physical Activity
- Activities, Physical
- Activity, Physical
- Physical Activities
- Exercise, Physical

Previous Indexing:

- [Exertion \(1966-1988\)](#)
- [Physical Fitness \(1966-1988\)](#)

See Also:

- [Exercise Therapy](#)
- [Physical Exertion](#)
- [Physical Fitness](#)
- [Sports](#)
- [Exercise Movement Techniques](#)

All MeSH Categories

Phenomena and Processes Category

Musculoskeletal and Neural Physiological Phenomena

Musculoskeletal Physiological Phenomena

Movement

Motor Activity

Exercise

Cool-Down Exercise

Exergaming

Gymnastics

Muscle Stretching Exercises

Physical Conditioning, Animal

Physical Conditioning, Human

Circuit-Based Exercise

Endurance Training

High-Intensity Interval Training

Plyometric Exercise

Resistance Training

Post-Exercise Recovery

Preoperative Exercise

Running

Jogging

Marathon Running

Swimming

Walking

Nordic Walking

Stair Climbing

Warm-Up Exercise

All MeSH Categories

Anthropology, Education, Sociology and Social Phenomena Category

Human Activities

Exercise

Compulsive Exercise

Cool-Down Exercise

Exergaming

Gymnastics

Muscle Stretching Exercises

Physical Conditioning, Human

Circuit-Based Exercise

Endurance Training

High-Intensity Interval Training

Plyometric Exercise

Resistance Training

Post-Exercise Recovery

Preoperative Exercise

Running

Jogging

Marathon Running

Swimming

Walking

Nordic Walking

Stair Climbing

Warm-Up Exercise

<https://www.wordhippo.com/>



What is another word for **exercise**?



Need *synonyms for exercise*? Here's a list of *similar words* from our *thesaurus* that you can use instead.

Contexts ▼

Noun

Activity requiring physical effort, carried out to sustain or improve health and fitness

The use or application of a faculty, right, or process

A task set to test a skill or to prove a point

... more ▼

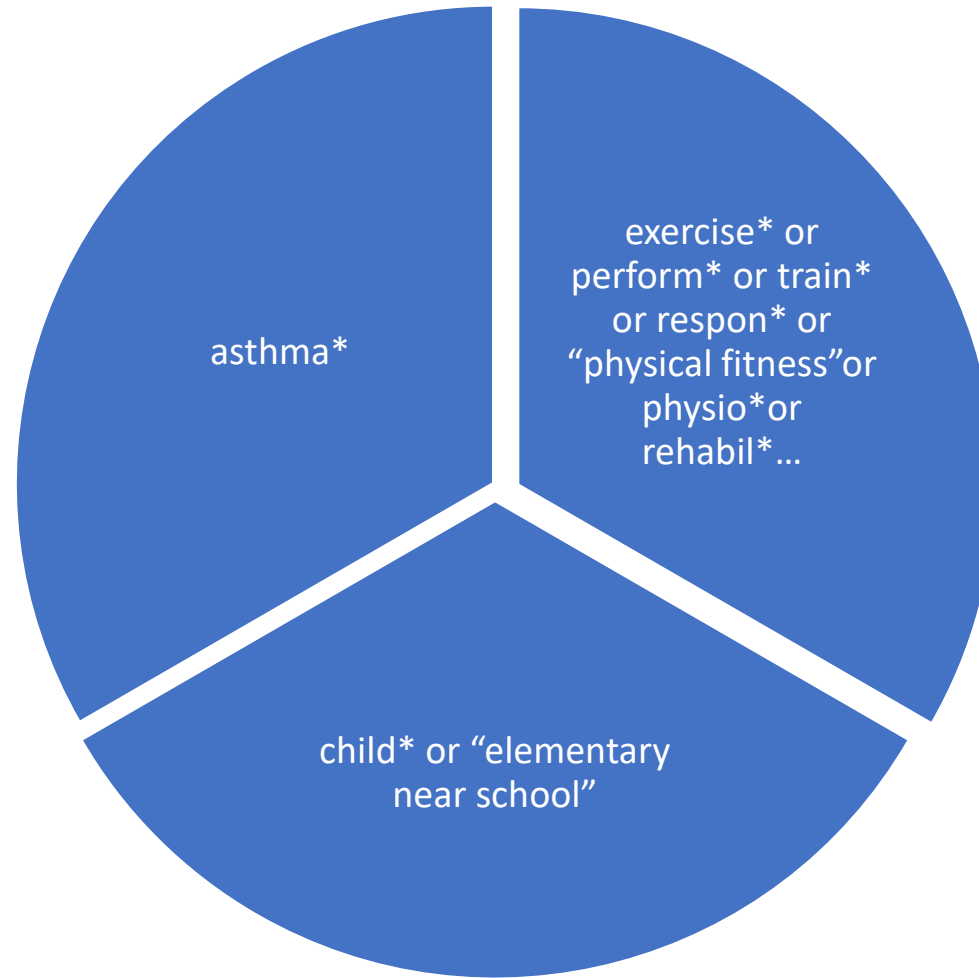
Noun ▲

Activity requiring physical effort, carried out to sustain or improve health and fitness

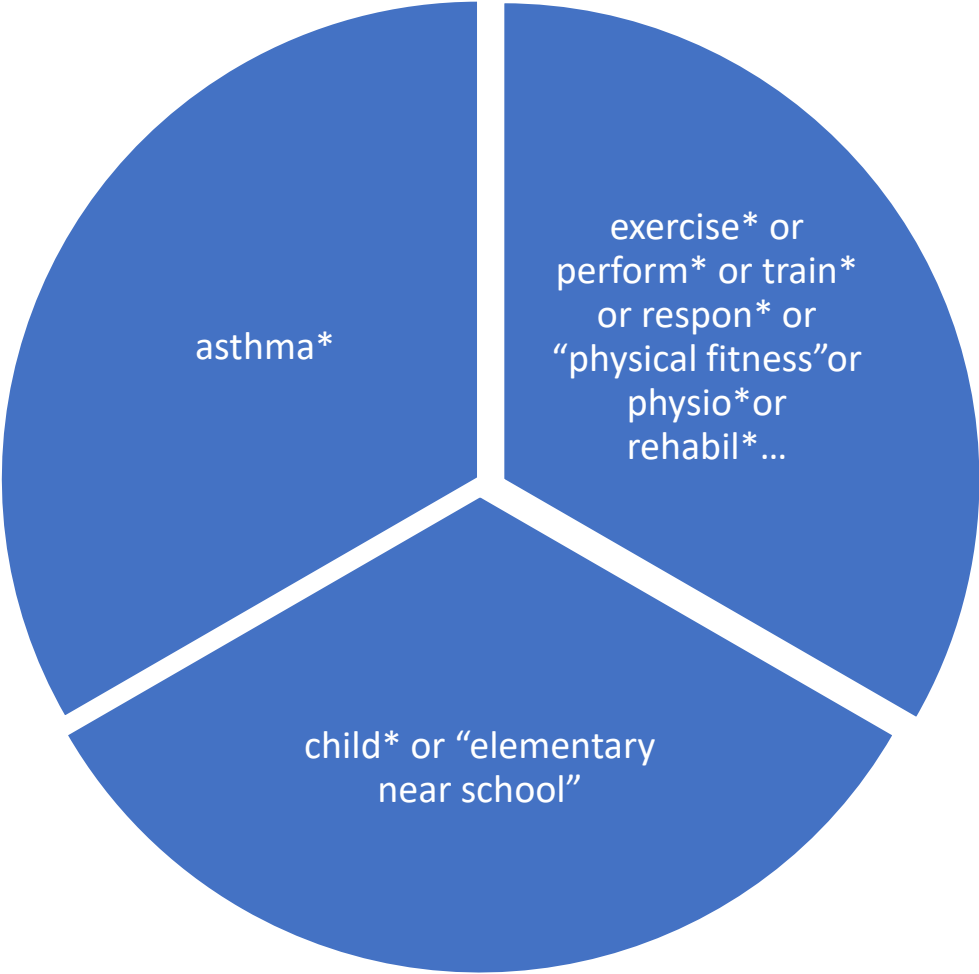
training activity fitness exercising keeping fit working out
exertion movement sports gym staying fit workouts
physical activity physical movements physical training conditioning
action games practice practise drills workout
physical education PT PE aerobics gymnastics
physical exercise athletics P.E. [more >](#)

*"I believe that engaging in **exercise** isn't just beneficial for your health, but also does wonders for relieving stress."*

What are the challenges faced by practitioners treating children with asthma by exercise?



What are the challenges faced by practitioners treating children with asthma by exercise?



Google, Advanced Google,
Google Scholar...

MEDLINE, Embase, Education
Source, Sport Discuss, Web of
Science Core Collection,
Academic Search Premier...

2000+, English language, original
data from scholarly peer reviewed
articles...

challeng* or barrier* or role
or roles or outcome* or
treatment* or intervention*
or approach* or behav*...

Zoterobib

Zotero

Library Seminar Agenda

- Research Question
- [Brock Library KINE Research Guide](#)
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

Kinesiology

WELCOME

ARTICLES

BOOKS

GREY LITERATURE

DATA

BORROW FROM OTHER LIBRARIES

ADDITIONAL COURSE GUIDES

Need Help?



Ask
Chat is closed
Click to send an email

Contact us at libhelp@brocku.ca or
find more library help on our
[Research Support](#) page.

Kinesiology

What is this guide for?

This guide has been designed as a general program guide and is curated by [Brock librarians](#). It features links to most often used resources such as databases for books, peer-reviewed journal articles, theses, dissertations, open educational resources (OEDs), systematic reviews, and more. Use the tabs on the left to navigate through the web page.

Selective course-related guides are provided when appropriate every term.

KINE 1P93 Library Seminar Fall 2023 ppt [slides](#) (PDF) and [video](#).

KINE Stuff Fall 2023 ppt [slides](#) (PDF)

KINE Honors Students Library Seminar Fall 2023 ppt [slides](#) (PDF)

KINE 4P84 Library Library Seminar Winter 2024 ppt [slides](#) (PDF) and [video](#) (YouTube, 32:49)



[PubMed: Building a Search](#) (2022, John Hopkins Welch Medical Library, YouTube, 17:13)

[How to Recognize an Original Research Article](#) (2020, Collier Library, PowToon, YouTube, 3:27)

[Primary Research in PubMed](#) (2021, Emily Metcalf, Texas A&M University-Corpus Christi Library, YouTube, 4:15)

Kinesiology

WELCOME

ARTICLES

BOOKS

GREY LITERATURE

DATA

BORROW FROM OTHER LIBRARIES

ADDITIONAL COURSE GUIDES

Need Help?



Ask
Chat is closed
Click to send an email

Contact us at libhelp@brocku.ca or
find more library help on our
[Research Support](#) page.

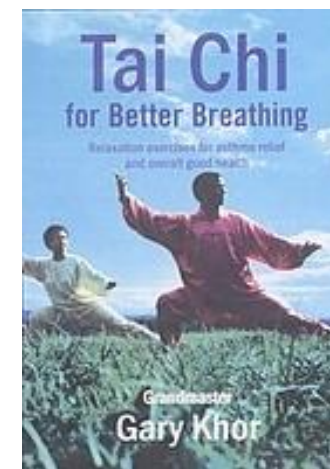
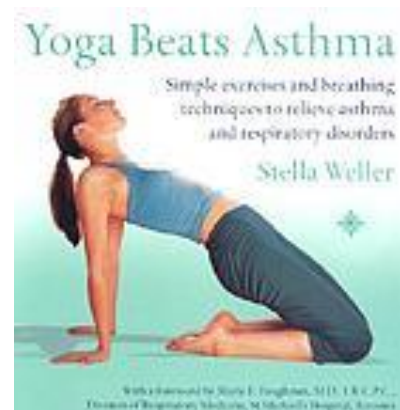
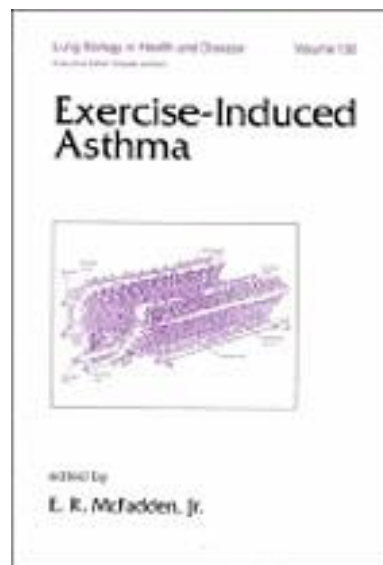
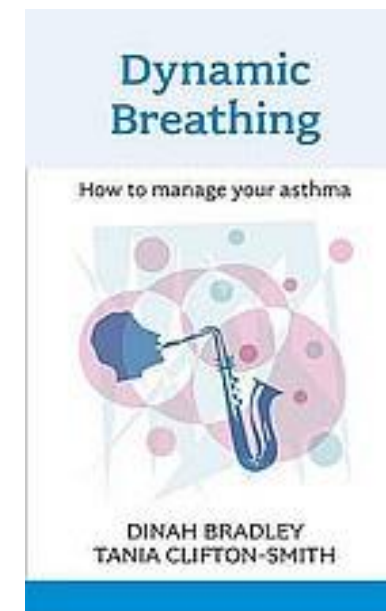
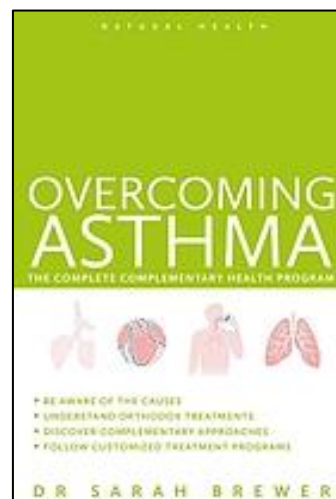
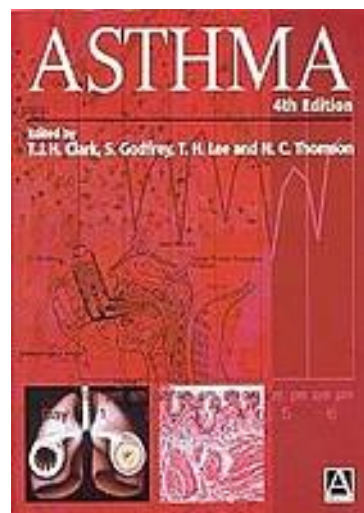
Books

Kinesiology scholarly books or ebooks range from introductory textbooks, handbooks, and subject-specific resources. A select list of [databases](#) that identify books/ebooks are listed below.

The most straightforward way to find books is by using [Omni](#) our local search interface!

Book & E-Book databases

- [Omni](#) 
 - Brock's largest Interdisciplinary search tool
 - Millions of journal articles, books & ebooks, newspapers, videos, magazines and more!
- [Google Books](#)
Select "Limited preview and full view" and "Books" for best results.
- [Directory of Open Access Books \(DOAB\)](#) 
 - Interdisciplinary
 - Find full text, peer-reviewed books and edited volumes.
 - [Terms of Use from Publisher Site](#)
- [WorldCat](#) 
 - World's largest network of library-based collections.
 - Search library catalogues from around the world for books, audiovisual materials, videos, digital files, theses and journal articles.
 - [Terms of Use from Publisher Site](#)



Kinesiology

WELCOME

ARTICLES

BOOKS

GREY LITERATURE

DATA

BORROW FROM OTHER LIBRARIES

ADDITIONAL COURSE GUIDES

Need Help?



Contact us at libhelp@brocku.ca or
find more library help on our
[Research Support](#) page.

Grey Literature

Grey literature **databases** identify resources that are key to research and scholarship. Many are open resources that go through a quality control process before they are published.

Definitions are scholarly dictionaries, encyclopedias and handbooks that help define terms and provide additional context.

[Concise Medical Dictionary \(2020\)](#) [Taber's Cyclopedic Medical Dictionary \(2021\)](#) [Dictionary Plus: Medicine and Health \(2016\)](#)

[Gale Encyclopedia of Fitness \(2017\)](#)

[Encyclopedia of Sports Medicine \(2011\)](#)

[Encyclopedia of Exercise Medicine in Health and Disease \(2012\)](#)

[Oxford Encyclopedia of Sport, Exercise, and Performance Psychology \(2019\)](#)

[Oxford Companion to the Body \(2001\)](#)

[Routledge International Encyclopedia of Sport and Exercise Psychology \(2020, 2 volumes\)](#)

Occupational Health and **Safety** information is essential to dealing with injuries, accidents, government and regulatory information.

Theses and Dissertations are important unpublished resources granted and retained by universities as capstone projects, these, and dissertations.

Open Education Resources (OERs) are digital ebooks and learning objects that can be used as open textbooks on a wide variety of general and disciplinary subjects.

Systematic Reviews and Evidence Synthesis research involves specialty **databases** and resources.

of this fungus is an odd impossibility because it is present in the environment virtually everywhere. Research efforts are being directed at enhancing patients' resistance to *Aspergillus* rather than trying to eliminate exposure to the fungus. Given the growing number of people with immune disorders or whose immune systems have been suppressed in the course of treating another disease, research and clinical trials for new antifungal agents will be increasingly important in the future.

Public health role and response

The CDC takes several steps to combat fungal diseases such as aspergillosis. The Mycotic Diseases

GALE ENCYCLOPEDIA OF ENVIRONMENTAL HEALTH, 2ND EDITION

Asthma

Definition

Asthma is a chronic inflammatory disease of the airways, the body's breathing tubes, consisting of the bronchi and smaller bronchioles in the upper part of the lungs. Persistent inflammation in the airways tissue in the muscular walls of the airway to swell extra mucus to be produced. The airways become narrowed, blocking air flow and trapping air in the lungs. As a result, individuals with asthma have symptoms

Yoga and yogic breathing techniques

Some studies have shown that yoga significantly helps people with asthma by teaching exercises specifically designed to expand the lungs, promote deep breathing, and reduce stress. Pranayama is the yogic science of breathing, which includes hundreds of deep breathing techniques. These breathing exercises may be done daily as part of any treatment program for asthma, as they are an effective and inexpensive measure that can be done anywhere.

Controlled exercise

Many people, including parents of children with asthma, believe that people with asthma should not exercise. Many parents believe it is dangerous for their asthmatic children to participate in sports or physical exercise, but physical activity has been shown to benefit all children, including those with asthma. Parents are advised to work with their children's healthcare providers and any coach or organized sport leader to help plan and then carefully monitor their children's physical activities.

Acupuncture

Acupuncture can be an effective treatment for asthma. It is used in TCM along with dietary changes. Acupressure also can be used as a self-treatment and prevention for asthma attacks. The Lung 1 points in acupuncture, used to stimulate breathing, can be found on the chest easily. These are sensitive, often knotted spots on the muscles that run horizontally about an inch below the collarbone and about two

Prognosis

More than half of all asthma cases in children resolve by young adulthood, but in some children with chronic infection and/or exposure to environmental pollution, cigarette smoke, and allergens, resolution may be less likely. Infants and toddlers who have persistent wheezing even without viral infections and those who have a family history of allergies are most likely to continue to have asthma into the school-age years.

Most individuals with asthma respond well once the proper drug or combination of drugs is found and are able to lead relatively normal, active lives. A relatively few individuals will have progressive breathing difficulties and run the risk of respiratory failure requiring intensive treatment. About 3,400 individuals in the United States die from asthma each year.

Prevention

Exposure to the common allergens and irritants that provoke asthmatic attacks often can be reduced or avoided by implementing the following preventive measures:

- Identify the specific trigger of asthma attacks. Reducing exposure to known triggers is the best way to prevent attacks.
- If the individual is sensitive to a family pet, remove the animal from the home. If this is not acceptable, keep the pet out of the bedroom (with the bedroom door closed), remove carpeting, and keep the animal away from upholstered furniture.

Exercise-induced asthma

Individuals who do not have allergies may still develop a form of asthma triggered by aerobic exercise. These exercise-induced episodes can last for several minutes and leave the individual gasping for breath. About 12%–15% of Americans who do not have allergies are estimated to be susceptible to exercise-induced asthma; rates as high as 40%–90% have been reported among individuals who do have allergies. Inhaling cold air, aerobic exercise lasting more than ten minutes or shorter periods of very heavy aerobic exercise tend to trigger an exercise-induced asthma attack in susceptible individuals. Exposure to airborne pollutants and certain chemicals (e.g., chlorine in pools, herbicides on a playing field) appear to increase the likelihood of asthma episodes in sensitive individuals.

Causes and symptoms

Causes and symptoms vary between individuals. Not every person with asthma has the same symptoms and even common symptoms may manifest in response to different triggers. Some children have an asthma attack when running or playing hard, especially in cold weather. Upper respiratory infections, laughing, and crying hard can all cause an asthma attack. Periods of time pass without symptoms in some individuals, whereas others may have symptoms daily. Mild asthma attacks are more common than severe attacks, which last longer and require immediate medical care.

Causes

beta-blocker drugs, especially in adults.

Inhaling tobacco smoke, either from smoking or being around people who are smoking, can irritate the airways and trigger an asthmatic attack. Air pollutants such as wood smoke can have a similar effect. In addition, three factors regularly produce attacks in certain asthmatic individuals and may sometimes be the sole cause of symptoms:

- inhaling cold air (cold-induced asthma)
- exercising hard
- having stress or heightened anxiety

Symptoms

Asthma attacks are usually accompanied by warning signs and rarely happen without them. The most common warning signs are:

- lack of appetite, fatigue, headache, or coughing (especially at night)
- dark circles under the eyes, less tolerance for exercise
- tightness or pressure in the chest
- shortness of breath
- wheezing

Wheezing is often obvious, but mild asthma attacks may be confirmed only when the physician listens to the chest with a stethoscope. Besides wheezing and being short of breath, individuals may cough and/or may report a feeling of tightness in the chest. Wheezing is often loudest when individuals breathe out (exhale) in an attempt to expel air through the narrowed airways. Some people with asthma are free of symptoms most of the time but occasionally may

Cramer, D. A., MD, & Culvert, L. L. (2019). Asthma. In J. L. Longe (Ed.), *The Gale Encyclopedia of Environmental Health* (2nd ed., Vol. 1, pp. 53-62). Gale.
<https://link.gale.com/apps/doc/CX2491100031/GVRL?u=st46245&sid=bookmark-GVRL&xid=9e5acd0f>

Kinesiology

WELCOME

ARTICLES

BOOKS

GREY LITERATURE

DATA

BORROW FROM OTHER LIBRARIES

ADDITIONAL COURSE GUIDES

Need Help?



Ask
Chat is closed
Click to send an email

Contact us at libhelp@brocku.ca or
find more library help on our
[Research Support](#) page.

Articles

Journal articles are scholarly works that go through a quality control process called **peer-review** before they are published.

MEDLINE is available via [OVID](#), [PubMed](#), [SciFinder-n](#) and [Web of Science Complete](#). Web of Science Complete includes Web of Science Core Collection, BIOSIS and more.

Several databases provide access to regional, national and international **news** articles.

A select list of **databases** that include scholarly articles are listed below.

- [Google Scholar](#) 
 - Find Peer-reviewed papers, theses, books, preprints, peer-reviewed articles, societies, repositories, universities and more.
 - Off-Campus access to Brock resources follows:
 1. Click on [Scholar Settings](#)
 2. Select 'Library links' from the left menu
 3. Type Brock in the Library links box
 4. Select Brock in the resulting list
 5. Click on the 'Save' button
 6. Follow the Find it @ Brock links to the full text
- [Web of Science Core Collection](#) 
 - Scholarly resources across all disciplines
 - Access to Cited Reference searching.
 - Includes Proquest Dissertations and Theses
 - [Permitted Uses](#)
[more info...](#)
- [Sport Discus](#) 
 - Scholarly literature covering all aspects of sport including, recreation, exercise physiology, sports medicine, coaching, physical fitness, the psychology, history and sociology of sport, training, and conditioning.
 - Find journal articles and book content.
 - [Permitted Uses](#)
[more info...](#)
- [MEDLINE - via OVID](#) 
 - International literature on biomedicine, allied health fields and biological and physical sciences, humanities, and information science as they relate to medicine and health care.
 - Coverage: 1946-current
 - [Permitted Uses](#)
[more info...](#)
- [Embase](#) 
 - Comprehensive biomedical database including more than 30 million records from more than 8,500 journals.
 - Notable coverage of drug and pharmaceutical research, pharmacology and toxicology as well as robust international content.
 - Coverage: 1974-current
 - [Permitted Uses](#)

Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- [Databases – lots of them](#)
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

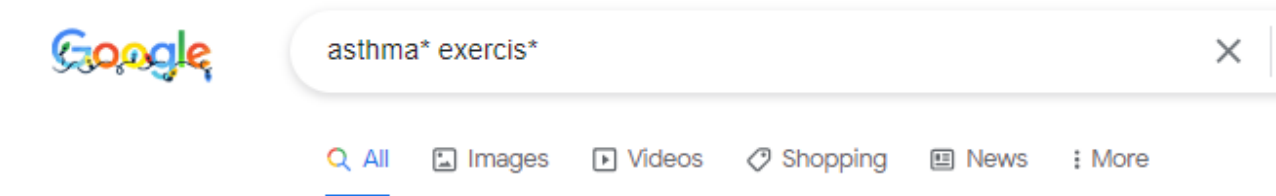
Academic Search Complete, AgeLine, [BASE](#), BioOne Complete, [bioRxiv](#), CINAHL Complete, [CORE](#), [Dimensions](#), [Directory of Open Access Journals \(DOAJ\)](#), Education Source, [Elicit](#), Embase, [figshare](#), Gender Studies Database, [Google](#), [Advanced Google](#), [Google Books](#), [Google Scholar](#), [Keenious](#), [MEDLINE via PubMed](#), MEDLINE via OVID, MEDLINE via Web of Science Complete, Omni, [Open Alex](#), [ORCID](#), [OSF Preprints](#), Oxford Reference, [Paperity](#), [PLOS](#), Politics Collection, ProQuest Sociology Collection, PsycINFO, [ResearchGate](#), [ResearchRabbit](#), Scholars Portal E-Journals, [SciELO](#), [Scite](#), [Scilit](#), ~~Scopus~~, [Semantic Scholar](#), Sport Discus, [The Lens](#), Web of Science Core Collection, [WorldWideScience.org](#), [WorldCat](#), [Zenodo](#)...

MEDLINE, Embase, Web of Science Core Collection, Sport Discuss, Education Source, PsycINFO, Academic Search Complete...

MEDLINE via [PubMed](#), via Web of Science Complete...



https://www.google.ca/



People also ask

What exercise is best for asthma?



Is it OK to exercise with asthma?



What is the difference between asthma and exercise-induced asthma?



What is the name for exercise asthma?



Feedback



Asthma Canada

<https://asthma.ca> › [get-help](#) › [exercising-asthma](#)

Asthma & Exercise

It's important to note that the benefits of regular exercise almost always outweigh the risks associated with exercise-induced asthma. These benefits include: ...



Mayo Clinic

<https://www.mayoclinic.org> › [syc-20372300](#)

Exercise-induced asthma - Symptoms & causes

Exercise-induced asthma is when the airways narrow or squeeze during hard physical activity. It causes shortness of breath, wheezing, coughing, and other ...

[Overview](#) · [Symptoms](#) · [When to see a doctor](#) · [Causes](#)



Healthline

<https://www.healthline.com> › [health](#) › [exercise-for-as...](#)

Exercise for Asthma: Best Exercises, Benefits, and More

Jan 28, 2020 — What exercises are best for people with asthma? · [Swimming](#) · [Walking](#) ·

[Hiking](#) · [Recreational biking](#) · [Short-distance track and field](#) · [Sports](#) ...

[Exercise and asthma](#) · [Best exercises](#) · [Tips for exercising with asthma](#)



Johns Hopkins Medicine

<https://www.hopkinsmedicine.org> › [health](#) › [asthma-a...](#)

Asthma and Exercise

However, don't completely avoid exercise. In fact, exercise is very beneficial to people with asthma. It can improve their airway function by strengthening ...

https://www.google.ca/advanced_search

Google

Advanced Search

Find pages with...

all these words:

exercise asthma children

this exact word or phrase:

any of these words:

training performance rehabilitation therap*

none of these words:

numbers ranging from:

to

Then narrow your results by...

language:

any language

region:

any region

last update:

anytime

site or domain:

terms appearing:

in the title of the page

file type:

Adobe Acrobat PDF (.pdf)

usage rights:

not filtered by license

Advanced Search



IDEA Health & Fitness Association

<https://www.ideafit.com> > personal-training > what-ar... ⋮

"What are your suggestions for working with clients who ...

Feb 8, 2018 — The trick to training clients who have exercise-induced asthma is in the warm-up. Warm-ups that have intense bouts with rest between them ...



American College of Allergy, Asthma and Immunology

<https://acaai.org> > Asthma > Types of Asthma ⋮

Exercise-Induced Bronchoconstriction (EIB)

Montelukast, a leukotriene receptor inhibitor, is also approved for the treatment of exercise-induced asthma symptoms. Taken once daily, this medication can ...



Taylor & Francis Online

<https://www.tandfonline.com> > ... > Volume 4, Issue 4 ⋮

Physiotherapy and intensive physical training in ...

by M Emtner · 1999 · Cited by 7 — One such tool is physical exercise, another is education. Persons with mild to moderate asthma are able to exercise at a maximal intensity level ...



Lung Health Foundation

<https://lunghealth.ca> > ... > A-Z Library > COPD ⋮

- Lung Health Foundation - COPD Management

... pulmonary rehabilitation (PR) programs. For people with chronic lung disease like COPD, regular exercise results in fewer flare-ups and hospitalizations and ...



Wiley Online Library

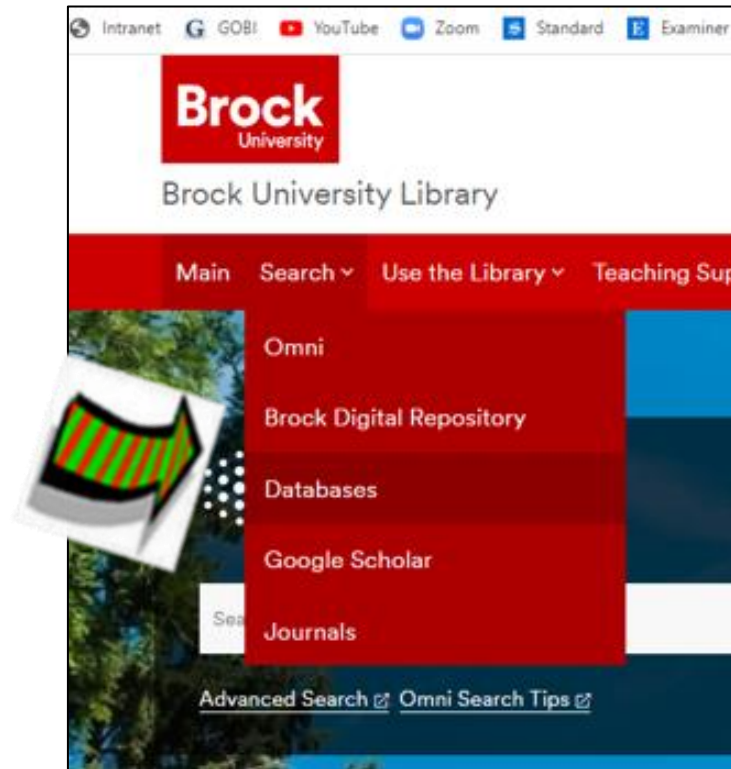
<https://onlinelibrary.wiley.com> > doi > abs > ppul ⋮

Exercise rehabilitation in pediatric asthma: A systematic ...

by J Jiang · 2022 — Abstract Objective This systematic review delineates various exercise-based pulmonary rehabilitation (PR) designs and quantifies how they ...

<https://brocku.ca/library/>

Google Scholar



https://scholar.google.ca/



asthma* exercis* child*



Articles

About 341,000 results (0.10 sec)

Any time

Since 2024

Since 2023

Since 2020

Custom range...

Sort by relevance

Sort by date

Any type

Review articles

☐ include patents

☒ include citations

 Create alert

Showing results for **asthma* exercise* child***

Search instead for **asthma* exercis* child***

Obesity, **asthma**, and **exercise** in **child** and adolescent health

[KD Lu](#), [K Manoukian](#)... - ... **exercise** science, 2016 - [journals.humankinetics.com](#)

... mechanisms linking **asthma**, obesity and **exercise** are often ... of assessing aerobic fitness in **children**. Addressing these gaps could ... of **asthma**, physical inactivity, and obesity in **children**. ...

[☆ Save](#) [🔗 Cite](#) [Cited by 38](#) [Related articles](#) [All 7 versions](#)

[\[HTML\] nih.gov](#)

Childhood **asthma** and **exercise**

[D Hughes](#) - [Paediatrics & child health](#), 2014 - [academic.oup.com](#)

... Some of these activities provoke respiratory symptoms in the **asthmatic child**, a ... **child** not previously known to have **asthma**. When physical activity causes symptoms in an **asthmatic child**...

[☆ Save](#) [🔗 Cite](#) [Cited by 17](#) [Related articles](#) [All 5 versions](#)

[\[HTML\] oup.com](#)

Children with **asthma** and physical **exercise**: effects of an **exercise** programme

[NHMJ van Veldhoven](#), [A Vermeer](#)... - [Clinical ...](#), 2001 - [journals.sagepub.com](#)

... a physical **exercise** programme for **children** with **asthma** on an ... -seven **children** with clinically diagnosed **asthma** participated ... **exercise** programme consisted of regular group **exercises** ...

[☆ Save](#) [🔗 Cite](#) [Cited by 140](#) [Related articles](#) [All 8 versions](#)

Exercise training in **children** with **asthma**: a systematic review

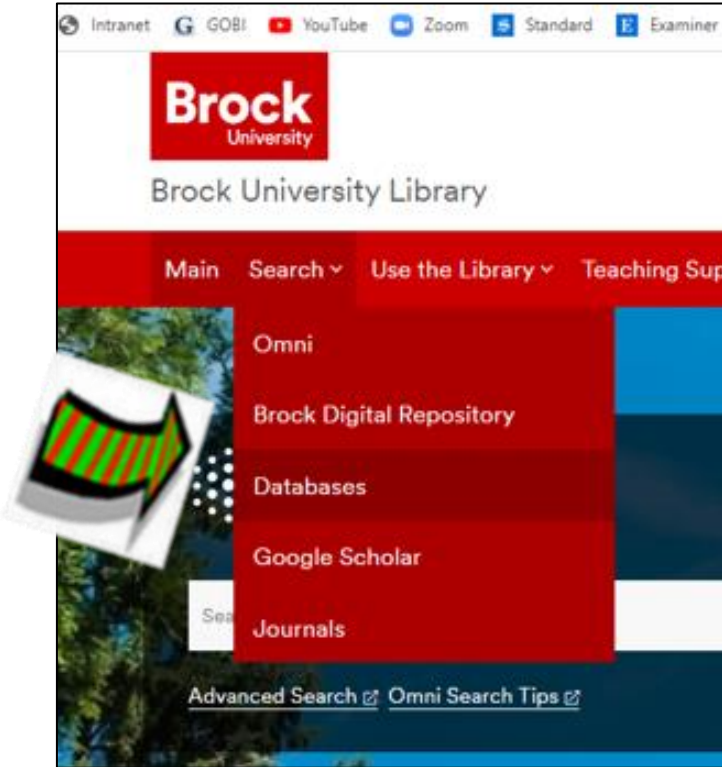
[VHM Wanrooij](#), [M Willeboordse](#)... - [British journal of sports ...](#), 2013 - [bjsm.bmj.com](#)

... **asthmatic children**. The objective of this manuscript is to provide a concise overview of the effects of **exercise** training on EIB and underlying **asthma** ... of life in **children** with **asthma**. Also, ...

[☆ Save](#) [🔗 Cite](#) [Cited by 182](#) [Related articles](#) [All 8 versions](#)

[\[PDF\] psu.edu](#)

https://brocku.ca/library/



<https://researchguides.library.brocku.ca/az/databases>

[Library](#) / [Research Guides](#) / [Find a Database](#)

Find a Database

Find a full list of databases the library subscribes to. Use the subject list to find databases for your program!

Database Title / Keyword

Subjects

Types

413 Databases

[All](#) [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) <#>

A

[Academic Search Complete](#) 

- Scholarly resources across all disciplines.
- [Permitted Uses](#)

MEDLINE – via Web of Science Complete [↗](#)

- Produced by the U.S. National Library of Medicine (NLM), the MEDLINE database is widely recognized as the premier source for bibliographic and abstract coverage of the biomedical, biomedicine and health research literature. MEDLINE indexes over 18 million references to articles from over 5,500 newspapers, newsletters and magazines including 1,500 core journals. MEDLINE covers research topics in biology, environmental science, plant and animal science, marine biology, chemistry, biophysics and related interdisciplinary fields. MEDLINE accommodates keyword searching while facilitating the use of MeSH Thesaurus controlled vocabulary, headings, qualifiers and major topics. MEDLINE via Web of Knowledge provides a unique ability to analyze and refine search results, sort records, save search histories, utilize EndNote Web and Refworks bibliographic management tools and create customized citation alerts that automatically sends citations of interest to your email account.
- Coverage: 1950–current ; updated weekly.
- [Permitted Uses](#)

MEDLINE – via PubMed [↗](#)

Alumni Access

Open Access

- Full version of MEDLINE with access to the MESH thesaurus.
- Coverage: 1966–current
- [Terms of Use from Publisher Site](#)

MEDLINE – via OVID [↗](#)

- International literature on biomedicine, allied health fields and biological and physical sciences, humanities, and information science as they relate to medicine and health care.
- Coverage: 1946–current
- [Permitted Uses](#)

Education Source, ERIC, Academic Search Premier, Sport Discus, CINAHL...





Searching: **SPORTDiscus**, [Show all](#) | [Choose Databases](#)

exercise or 'physical activity' or fitness

TI Title ▾

Search

AND ▾

asthma*

SU Subject Terms ▾

Create Alert

AND ▾

child* or elementary n3 student*

Select a Field (optional) ▾

Clear ?

+

-

[Basic Search](#) | [Advanced Search](#) | [Search History](#) ▸

Refine Results

Current Search ▾

Find all my search terms:
TI (exercise or 'physical activity' or fitness) AND SU ...

Expanders

Apply equivalent subjects 

Limiters

Peer Reviewed 

Publication Date: 20000101-20231231 

Source Types

Academic Journals 

Language

english 

Clear All

Limit To ▾

☐ References Available

☒ Peer Reviewed

Search Results: 1 - 50 of 441

Relevance ▾ | Page Options ▾

1. Perceptions surrounding the possible interaction between **physical activity**, pollution and **asthma** in **children** and adolescents with and without **asthma**.



By: Jordan, Kathryn A.; Mackintosh, Kelly A.; Davies, Gwyneth A.; Griffiths, Chris J.; Lewis, Paul D.; McNarry, Melitta A. BMC Public Health. 12/5/2023, Vol. 23 Issue 1, p1-10. 10p. DOI: 10.1186/s12889-023-17174-6 . Database: Academic Search Complete

 [HTML Full Text](#)  [PDF Full Text](#)  [Save PDF to Cloud](#) (1.7MB)

Academic Journal

2. Perceived **exercise** limitation in **asthma**: The role of disease severity, overweight, and **physical activity** in **children**.



By: Westergren, Thomas; Bernsten, Sveinung; Ledrup Carlsen, Karin C.; Mowinkel, Petter; Håland, Geir; Fegran, Liv; Carlsen, Kai-Håkon. Pediatric Allergy & Immunology. Feb2017, Vol. 28 Issue 1, p86-92. 7p. DOI: 10.1111/pai.12889

 [HTML Full Text](#)  [PDF Full Text](#)  [Save PDF to Cloud](#) (241KB)

Academic Journal

3. Does **exercise**-induced bronchoconstriction affect **physical activity** patterns in asthmatic **children**?



(includes abstract) van der Kamp, MR; Thio, BJ; Tabak, M; Hermens, HJ; Driessen, JMM; van der Palen, JAM Journal of Child Health Care, Dec2020; 24(4): 577-588. 12p. (Journal Article - research, tables/charts) ISSN: 1367-1039

[Find Full Text](#)

Academic Journal

Database ▾

☒ All Databases

☐ Academic Search Complete (205)

☐ CINAHL (175)

☐ SPORTDiscus (54)

☐ Education Source (25)

Physical activity and quality of life in children with well-controlled asthma.

Authors: [Peftoulidou, Pauline](#)¹ (AUTHOR)
[Gioulvanidou, Maria](#)¹ (AUTHOR)
[Chrysochoou, Elissavet-Anna](#)¹ (AUTHOR)
[Hatziaorou, Elpis](#)¹ (AUTHOR)

Source: [Journal of Asthma](#). May2023, Vol. 60 Issue 5, p1031-1037. 7p.

Document Type: Article

Subject Terms: [*ASTHMA in children](#)
[*PHYSICAL activity](#)
[*QUALITY of life](#)
[*WHEEZE](#)
[*JUVENILE diseases](#)
[*PEDIATRIC clinics](#)

Author-Supplied Keywords: [asthma](#)
[physical activity](#)
[quality of life](#)
[questionnaire](#)

NAICS/Industry Codes: [622310](#) Specialty (except Psychiatric and Substance Abuse) Hospitals
[621110](#) Offices of physicians
[622112](#) Paediatric hospitals
[622110](#) General Medical and Surgical Hospitals
[621111](#) Offices of Physicians (except Mental Health Specialists)

Peftoulidou, P., Gioulvanidou, M., Chrysochoou, E.-A., & Hatziaorou, E. (2023). Physical activity and quality of life in children with well-controlled asthma. *Journal of Asthma*, 60(5), 1031–1037. <https://doi.org/10.1080/02770903.2022.2123742>

Abstract: Asthma is the most common disease in childhood. Appropriate management and programs encouraging exercise enable children to enjoy a good quality of life (QoL). To assess the association between lung function, physical activity (PA), and QoL in children with well-controlled asthma. Fifty-four children aged 7–14 years attending a Pediatric Asthma Clinic were included. All children underwent spirometry and completed three self-administered validated questionnaires: The Godin Leisure-Time Exercise Questionnaire (GLTEQ), the ACT (Asthma Control Test), and the DISABKIDS for QoL. Mean age of the study population was 11.43(±2.1), BMI, kg/m2 (20.8 ± 3.9), FVCpp (97.1% ±12.4), and FEV1pp (99.7% ±12.43), ACT (23.4 ± 3). The GLTEQ revealed that only 3% of the studied population presented satisfactory activity, while 86% were sedentary. Both FEV1pp, and PA were significantly correlated to the children's QoL ((r2: 0.55, p:0.0001), and (r2:0.45, p:0.003), respectively). Despite reasonable asthma control, the children exhibited low physical activity levels, which negatively correlated to their QoL. Families of asthmatic children should be educated to highlight the benefits of exercise and increase the PA of their children. [ABSTRACT FROM AUTHOR]



Physical activity and quality of life in children with well-controlled asthma

Pauline Peftoulidou, MSc, Maria Gioulvanidou, MD, Elissavet-Anna Chrysochoou, MD, PhD and Elpis Hatzigorou, MD, PhD 

Paediatric Pulmonology Unit, 3rd Paediatric Department, Aristotle University of Thessaloniki, Hippokraton Hospital, Thessaloniki, Greece

ABSTRACT

Background: Asthma is the most common disease in childhood. Appropriate management and programs encouraging exercise enable children to enjoy a good quality of life (QoL).

Objective: To assess the association between lung function, physical activity (PA), and QoL in children with well-controlled asthma.

Methods: Fifty-four children aged 7–14 years attending a Pediatric Asthma Clinic were included. All children underwent spirometry and completed three self-administered validated questionnaires: The Godin Leisure-Time Exercise Questionnaire (GLTEQ), the ACT (Asthma Control Test), and the DISABKIDS for QoL.

Results: Mean age of the study population was $11.43(\pm 2.1)$, BMI, kg/m^2 (20.8 ± 3.9) , FVCpp $(97.1\% \pm 12.4)$, and FEV1pp $(99.7\% \pm 12.43)$, ACT (23.4 ± 3) . The GLTEQ revealed that only 3% of the studied population presented satisfactory activity, while 86% were sedentary. Both FEV1pp, and PA were significantly correlated to the children's QoL ($r^2: 0.55$, $p: 0.0001$), and ($r^2: 0.45$, $p: 0.003$), respectively).

Conclusions: Despite reasonable asthma control, the children exhibited low physical activity levels, which negatively correlated to their QoL. Families of asthmatic children should be educated to highlight the benefits of exercise and increase the PA of their children.

ARTICLE HISTORY

Received 10 May 2022

Revised 30 August 2022

Accepted 7 September 2022

KEYWORDS

asthma; quality of life; physical activity; questionnaire

Introduction

Asthma remains the most frequent disease of childhood (1,2). It is estimated that almost one out of five children aged 13–14 years has asthma in English-speaking countries of North America, Europe, and Australasia, while an estimated 8.6% of the population aged 18–45 years report asthma symptoms (attacks of wheezing or whistling breath) in the past 12 months (3). In Greece, asthma is a significant contributor to total childhood morbidity. Following the global trend, the prevalence of asthma in Greece has been rising during the last three decades (4,5). The degree to which asthma affects health-related quality of life (HRQoL) depends on various factors, the most critical being asthma control (3,6). Appropriate asthma management can enable children to enjoy a good quality of life. Therefore, asthma management through additional individual exercise programs may positively affect daily problems by enhancing lung function and encouraging participation in collective activities despite the disease (7). Studies have also demonstrated that through exercise, asthma exacerbations are both

reduced and prevented (8). Therefore, physical activity (PA) can positively affect asthma control among asthmatic children by improving their physical fitness. This can reduce the threshold of triggers causing asthma symptoms, leading to decreased medication use and increased quality of life (9).

Current evidence shows that regular physical activity improves general health and can positively impact asthma outcomes, such as exercise capacity, asthma control, and quality of life (10,11). Despite this, many asthma patients do not engage in regular physical activity because they mistakenly believe they should restrict exercise participation. Children with well-controlled asthma should not refrain from physical activity (12,13).

The aim of the study was to assess PA and QoL among children with well-controlled asthma; the secondary aim was to evaluate the correlation between PA and lung function on the one hand, and QoL, on the other.

Methods

In the present prospective study, 54 children aged 7–14 years (59% male, 41% female) with well-controlled

Peftoulidou, P., Gioulvanidou, M., Chrysochoou, E.-A., & Hatzigorou, E. (2023). Physical activity and quality of life in children with well-controlled asthma. *Journal of Asthma*, 60(5), 1031–1037. <https://doi.org/10.1080/02770903.2022.2123742>

MeSH terms

- Asthma* / epidemiology
- Child
- Exercise
- Humans
- Quality of Life
- Spirometry
- Surveys and Questionnaires

intermittent and mild persistent asthma without any other co-morbidities were included (14). Asthma control is defined as the degree to which disease manifestations are reduced or removed by therapy (15). Asthma control was evaluated with a detailed history of asthma symptoms, sleep disturbances, limitation of activity, and frequency of reliever use in the past four weeks (14,15). Demographics and patient characteristics were collected at the Pediatric Outpatient Asthma Clinic of a tertiary referral hospital over 12 months. All children underwent spirometry performed by experienced personnel and completed three self-administered questionnaires, as part of their evaluation, without knowing the purpose of the study, to ensure objective and blinded results. The Godin Leisure-Time Exercise Questionnaire (GLTEQ) is a simple, reliable, and effective tool for assessing physical activity among children and adolescents (Appendix 1) (16,17). It estimates physical activity over a typical week and is divided into three categories of intensity expressed as METs (Metabolic equivalent of task). GLTEQ is expressed in units (strenuous > 24, moderate 14–23, mild <14), ranking individuals from the highest to the lowest. The second questionnaire used was the ACT (Asthma Control Test), ranging from 5 to 25 (a score over 19 refers to reasonable asthma control) (Appendix 2) (18–20). The third questionnaire was the DISAKIDS questionnaire to assess the quality of life. The questionnaires used were the DISABKIDS chronic generic measure—long form (DCGM-37) and the DISABKIDS Condition-specific modules for asthma (Appendices 3 and 4). The DISABKIDS chronic generic module (DCGM37) consists of 37 rating-scaled items assigned to six dimensions: Independence, Emotion, Social inclusion, Social exclusion, Limitation, and Treatment. These scales have shown satisfactory internal consistencies, ranging from a α 0.79 (Social inclusion) to a α 0.90 (Emotion). Therefore, these six dimensions can be combined to produce a general score for HRQoL (health-related quality of life). The condition-specific asthma questionnaire (DISABKIDS Asthma Module) consists of two domains: the impact domain (six items) concerning limitations and symptoms and the worry domain (five items) concerning fears related to asthma. The internal consistency of the impact domain is a α 0.83 and a α 0.84 for the worry domain (21).

The respiratory function was evaluated with spirometry [FVC = Forced Vital Capacity - (L)], [FEV₁ (Forced Expiratory Volume) - (L)] and [PEF_{25–75%} (Forced Expiratory Flow) - (L/s)]. The children and their parents were informed about the procedure for

completing the questionnaires and consented to participate. The local ethics committee approved the study. The time required to complete the questionnaires was approximately 20–25 min.

Statistical analysis

The Student's t-test and the Mann-Whitney test were used to evaluate the association between normally distributed and skewed continuous variables, respectively, with a categorical variable consisting of two groups. The Pearson correlation coefficient was used to estimate the correlation between the different parameters. A probability value of 5% was considered statistically significant ($p < 0.05$). All calculations were conducted using SPSS for Windows (v19, SPSS Inc, Chicago, IL, USA). The patients' characteristics data were expressed as mean $\pm$ SD.

Results

Demographics of the study population (all were Caucasians living in a rural area) are shown in Table 1. The mean age of the study population was 11.43 (± 2.1), 59% boys, BMI, kg/m² (20.8 ± 3.9), FVCpp (97.1% ± 12.4), and FEV1pp (99.7% ± 12.43), ACT (23.4 ± 3). The 98% of the study population showed well-controlled asthma with an ACT score >19. The GODIN physical activity questionnaire revealed that only 3% of the studied population presented strenuous exercise, 11% presented moderate exercise, and the majority (86%) led a more sedentary lifestyle (light exercise). (Figure 1).

The results of the Quality-of-Life questionnaires are shown in Figure 2. The most restraining adversely affected parameters were the sense of social exclusion

Table 1. Characteristics of the asthmatic children.

Patient characteristics	N (percentage) or mean value ($\pm$ SD)
N	54
Males, N (%)	32 (59.26%)
Females, N (%)	22 (40.74%)
Age (years)	11.43 (± 2.1)
BMI, kg/m ²	20.8 $\pm$ 3.9
FVC, % predicted	97.1% (± 12.4)
FEV1, % predicted	99.7% (± 12.43)
FEF 25–75, % predicted	95.38% (± 29.15)
Godin Leisure-Time Exercise Questionnaire (GLTEQ)	8.8 $\pm$ 5.6
ACT score (Asthma Control Test)	23.4 $\pm$ 3
Asthma severity, N (%)	32 (59.3%)
• Intermittent	22 (40.7%)
• Mild persistent	
Prophylactic or reliever medication, N(%)	32 (59.3%)
• As-needed short-acting β_2 -agonist (SABA)	2 (3.7%)
• Leukotriene receptor antagonist (LTRA)	20 (37.0%)
• Daily low dose inhaled corticosteroid (ICS)	

(stigma, feeling left out), social inclusion (acceptance of others, positive social relationships), the worry about the disease and medication burden. In addition, FEV1pp, as well as physical activity, showed a significantly but moderate correlation to the children's quality of life (r^2 : 0.55, $p < 0.0001$) and (r^2 : 0.45, $p < 0.003$), respectively (Figures 3 and 4). However, no significant correlation was found between the physical activity level and FEV1pp (Figure 5).

Discussion

In the present study, we evaluated the level of physical activity among children with well-controlled asthma and assessed the correlation of PA with QoL and lung function. The results demonstrated that most children showed low physical activity levels despite their well-controlled asthma. The sense of social exclusion, social inclusion, the worry about asthma, and medication burden were the most significant affected parameters of their QoL. Furthermore, we showed a strong correlation between QoL, respiratory function, and PA. These findings highlight the need for appropriate education of asthmatic children and their families to encourage them to engage in physical activities by emphasizing the benefits of exercise and assuaging the family fears regarding exercise-induced dyspnea among asthmatic children with well-controlled asthma.

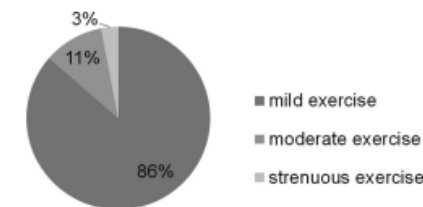


Figure 1. The physical activity level of the study population. The Godin Leisure Time Exercise (GLTE) questionnaire.

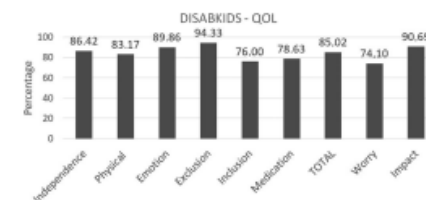


Figure 2. Disabkids questionnaire scores assessing QoL (chronic disease module and asthma module).

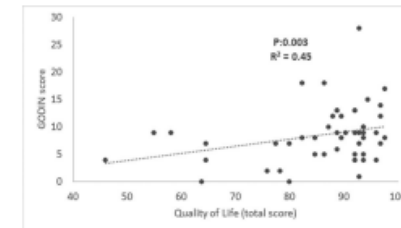


Figure 3. Physical Activity was significantly correlated to the children's QoL (r^2 : 0.45, $p < 0.003$).

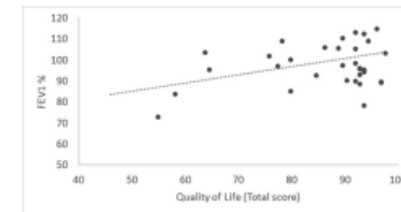


Figure 4. The respiratory function (FEV1pp) was significantly correlated to the children's QoL (r^2 : 0.55, $p < 0.0001$).

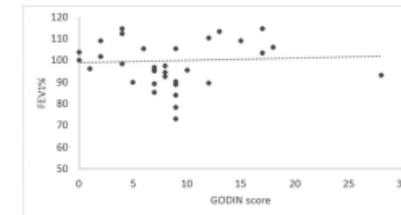


Figure 5. The level of Physical Activity did not correlate significantly with the FEV1pp.

Physical activity plays an essential role in childhood growth. However, the rates of physical activity have significantly declined, and sedentary time has markedly increased over the last decades (22). Concerning physical exercise, almost half of Greek children stand below the recommended duration of at least one hour per day of physical activity (23). The sedentary level of the children with asthma in our study may reflect the current activity level in children without asthma. The lung function parameters and the ACT questionnaire scale demonstrated that asthma was well controlled among the children in our study, but their GLTEQ scale revealed that the majority had a sedentary lifestyle (Figure 1), as only 3% were active. Although our results regarding the level of physical activity of asthmatic children agree with other studies (24–26), there is also data showing no evidence that asthmatic children are involved in less physical activity compared to healthy peers (27). Several factors may contribute to the inactivity of asthmatic children. While exercise is a common trigger for bronchoconstriction in asthmatic children, the fear of an asthma attack emerged as the main barrier to exercise, as reported by Winn et al. (28). Additional factors contributing to the inactivity of asthmatic children include negative self-efficacy, child and parents health beliefs, and less frequent advice about exercise they receive from physicians and teachers than their healthy peers (22,24,25). Parents believe that physical activity can worsen their children's asthma symptoms is an essential factor associated with their restrictive attitudes toward physical activities (9). As this behavior may discourage children from having an active, healthy lifestyle, it is vital to appropriately evaluate, effectively treat, and counsel the asthmatic family that they do not need to avoid physical activities and can be stimulated to be fully active. An effective asthma self-management, education, and empowerment program can increase physical activity among children with well-controlled asthma (29).

Despite well-controlled asthma, the most affected parameters of our study population QOL were social exclusion (stigma, feeling left out), social inclusion (acceptance of others, positive social relationships), worry about their disease, and medication burden (Figure 2). Stelmach et al. and Tibosch et al. showed that children, adolescents, and their caregivers reported few impairments in asthma-related QoL (30,31). On the other hand, Banjari et al. showed that significantly poorer quality of life was observed in children with uncontrolled asthma (32).

Although respiratory function values are usually within normal ranges in asthmatic children, the FEV1 decrease is associated with the disease's worsening, present or upcoming exacerbation, and exercise-induced bronchoconstriction (EIB) (25,33). Therefore, FEV1 is one of the most used clinical parameters for diagnosing and grading asthma severity (34). Also, as assessed by FEV1, asthma severity can predict the disease's progression, the patient's functional impairment, and QoL. Our study showed that respiratory function was significantly correlated to the children's QoL (Figure 3). Similar results were found by Levy et al., who used the PAQLQ (Pediatric Asthma Quality of Life Questionnaire) in a subgroup of children with well-controlled asthma (35).

As long as there is adequate asthma control, routine exercise has been proven safe in children with asthma (22). Regular PA by children and adolescents with asthma is associated with improving disease control and quality of life and reducing exacerbations, hospital admissions, school absenteeism, unscheduled medical visits, and the number of medications used to control asthma (9,36). Moreover, as the most common chronic disorder among top athletes, optimal diagnosis and treatment make it possible for athletes with asthma to compete equally with healthy athletes. When assessing the use of asthma drugs during the Olympic Games, it was even discovered that during the Winter and Summer Olympic Games from 2002 to 2010, the asthmatic athletes outperformed their healthy peers, taking more medals during the Olympics than their healthy peers (37).

Our data showed a significant correlation between physical activity and QoL (Figure 4). In this domain, the recent literature is contradictory. Basso et al. (38) and Fanelli et al. (39) in children and adolescents reported that physical activity is related to a better QoL. On the other hand, Matsunaga et al. (10) found no correlation between physical activity, asthma control, spirometry, and QoL.

Another feature of our study was the poor correlation between respiratory function and physical activity, probably because most children (86%) were sedentary despite well-controlled asthma and good lung function. Contrarily, in a 10-week randomized controlled trial (RCT) of aerobic exercise in 38 children with asthma, Abdelbasset et al. reported significant improvements in pulmonary function, including FEV1pp, FVCp, VO2max, and all dimensions of QoL in the exercise group compared to control (40). In addition, Ram et al., in a meta-analysis reviewing eight studies with a total of 226 subjects, showed that

physical training improves cardiopulmonary fitness without changing lung function (41).

Despite the effects of exercise on asthma outcomes, a particular form of exercise has not been proven more beneficial than others. An RCT of three different exercise interventions (swimming, football, and basketball) and a control group in children with asthma showed a significant improvement in lung function, their asthma symptoms, and general well-being in the swimming group compared to the others (42). Lahart and Metsios reported in a meta-analysis of the effects of swimming in non-elite or noncompetitive swimmers that children/adolescents with asthma presented substantial improvements in VO2max and PEF, significant reductions in bronchial hyper-responsiveness, improvements in exercise-induced bronchoconstriction, methacholine challenge test performance compared to controls (43).

Limitations of the study

The small sample size and the fact that the majority (86%) of the children had a sedentary lifestyle are potential limitations of the study. Moreover, we used the GODIN physical activity questionnaire to assess physical activity. However, more accurate ways of assessing physical activity like telemonitoring using accelerometers, pedometers, or electronic diary data have been developed. Although the physical activity questionnaires are less sensitive than physical activity assessed with accelerometry, it has been shown that the physical activity questionnaire might be used as a low-cost and easy-to-use PA screening tool for ruling out physical inactivity in a portion of the pediatric asthma population (20).

Conclusions

Our study showed that despite reasonable asthma control, the children presented low levels of physical activity, which negatively correlated to their quality of life. In children and adolescents with asthma, the disease may reduce the perceived capability to participate in physical activity contributing to an increase in the sedentary lifestyle. Therefore, families of asthmatic children should be educated on the benefits of exercise and the minimal risk of dyspnea among well-controlled asthmatic children in order to increase their physical activity.

Acknowledgements

We would like to thank all children with asthma and their families participating in the study.

Competing interests

None declared.

Conflict of interest statement

All authors would like to confirm that there is nothing to declare.

Funding

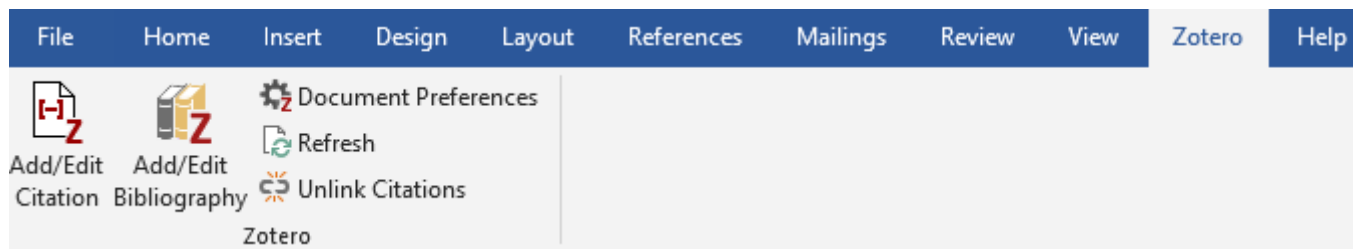
None.

ORCID

Elpis Hatziagorou  <http://orcid.org/0000-0001-9505-2054>

References

- Song P, Adeloye D, Salim H, Dos Santos JP, Campbell H, Sheikh A, Rudan I. Global, regional, and national prevalence of asthma in 2019: a systematic analysis and modelling study. *J Glob Health* 2022;12:04052. doi:10.7189/jogh.12.04052.
- Abbafati C, Abbas KM, Abbasi-Kangevari M, Abd-Allah F, Abdelalim A, Abdollahi M, Abdollahpour I, Abegaz KH, Abolhassani H, Aboyans V, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020;396(10258):1204–1222. doi:10.1016/S0140-6736(20)30925-9.
- Sullivan PW, Ghushchyan V, Navaratnam P, Friedman HS, Kavati A, Ortiz B, Lanier B. The national burden of poorly controlled asthma, school absence and parental work loss among school-aged children in the United States. *J Asthma* 2018;55(6):659–667. doi:10.1080/02770903.2017.1350972.
- Antonogeorgos G, Liakou E, Koutsokera A, Drakontaeidis P, Thanasia M, Mandrapiya M, Fouzas S, Ellwood P, Garcia-Marcos L, Panagiotakos DB, et al. Parental education moderates the association between indoor moisture environment and asthma in adolescents: the Greek Global Asthma Network (GAN) cross-sectional study. *BMC Public Health* 2022;22(1):1–9. doi:10.1186/s12889-022-13065-4.
- Anthracopoulos MB, Liolios E, Panagiotakos DB, Triantou K, Priftis KN. Prevalence of asthma among schoolchildren in Patras, Greece: Four questionnaire surveys during 1978–2003. *Arch Dis Child* 2007;92(3):209–212. doi:10.1136/adc.2006.106153.
- Network GA. The Global Asthma Report. 2014. http://globalasthmareport.org/resources/Global_Asthma_Report_2018.pdf
- Reichenberg K, Broberg AG. Quality of life in childhood asthma: use of the Paediatric Asthma Quality of Life Questionnaire in a Swedish sample of children 7 to 9 years old. *Acta Paediatr* 2007;89(8):989–995. doi:10.1111/j.1651-2227.2000.tb00423.x.



reported that physical activity is related to a better QoL. On the other hand, Matsunaga et al. (10) found no correlation between physical activity, asthma control, spirometry, and QoL.

Another feature of our study was the poor correlation between respiratory function and physical activity, probably because most children (86%) were sedentary despite well-controlled asthma and good lung function. Contrarily, in a 10-week randomized controlled trial (RCT) of aerobic exercise in 38 children with asthma, Abdelbasset et al. reported significant

KINE 4F84 Paper

Childhood exercise and asthma has limitations... According to Peftoulidou et al. (2023) their study commented that there was a “poor correlation between respiratory function and physical activity, probably because most children (86%) were sedentary despite well-controlled asthma and good lung function” (p. 1034).

References

Peftoulidou, P., Gioulvanidou, M., Chrysochoou, E.-A., & Hatziagorou, E. (2023). Physical activity and quality of life in children with well-controlled asthma. *Journal of Asthma*, 60(5), 1031-1037. <https://doi.org/10.1080/02770903.2022.2123742>

MEDLINE via Ovid

Search History (12) ^			Results
☐	# ▲ Searches		42224
☐	1	exp Asthma/ph, pp, th [Physiology, Physiopathology, Therapy]	89326
☐	2	*Exercise/	316
☐	3	1 and 2	118143
☐	4	*Asthma/	1528427
☐	5	(exercise* or train* or therap* or perform*).m_titl.	8095
☐	6	4 and 5	108296
☐	7	"asthma*".m_titl.	8044
☐	8	5 and 7	980177
☐	9	(school* or child*).m_titl.	1324
☐	10	8 and 9	1597
☐	11	3 or 10	492
☐	12	limit 11 to (english language and yr="2000 -Current" and "child (6 to 12 years)" and journal article)	

✓ 28. **Determinants of exercise capacity in children and adolescents with severe therapy-resistant asthma.**

Schindel CS, Schiwe D, Heinzmann-Filho JP, Gheller MF, Campos NE, Pitrez PM, Donadio MVF

Journal of Asthma. 59(1):115-125, 2022 Jan.

[Journal Article. Research Support, Non-U.S. Gov't]

UI: 33026845

Digital Object Identifier

<https://dx.doi.org/10.1080/02770...>

Authors Full Name

Schindel, Claudia Silva, Schiwe, Daniele, Heinzmann-Filho, Joao Paulo, Gheller, Mailise Fatima, Campos, Natalia Evangelista, Pitrez, Paulo Marcio, Donadio, Marcio Vinicius Fagundes

[Abstract Reference](#)

[Complete Reference](#)

[Find Similar](#)

[Find Citing Articles](#)

[Find it @ Brock](#)

[Abstract](#) [Cite](#) [+ My Projects](#) [+ Annotate](#)

Schindel, C. S., Schiwe, D., Heinzmann-Filho, J. P., Gheller, M. F., Campos, N. E., Pitrez, P. M., & Donadio, M. V. F. (2022). Determinants of exercise capacity in children and adolescents with severe therapy-resistant asthma. *Journal of Asthma*, 59(1), 115–125. <https://doi.org/10.1080/02770903.2020.1833915>



EXERCISE PHYSIOLOGY

Determinants of exercise capacity in children and adolescents with severe therapy-resistant asthma

Cláudia Silva Schindel, PhD^a , Daniele Schiwe, MSc^a , João Paulo Heinzmann-Filho, PhD^a ,
Mailise Fátima Gheller, PT^a , Natália Evangelista Campos, MSc^a , Paulo Márcio Pitrez, PhD^b , and
Márcio Vinícius Fagundes Donadio, PhD^a 

^aLaboratório de Atividade Física em Pediatria, Centro Infant, Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Porto Alegre, Brazil; ^bCentro Infant, Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS) and Hospital Moinhos de Vento, Porto Alegre, Brazil

ABSTRACT

Objective: To evaluate the exercise capacity of children and adolescents with severe therapy resistant asthma (STRA) aiming to identify its main determinants.

Methods: Cross-sectional study including individuals aged 6–18 years with a diagnosis of STRA. Clinical (age and gender), anthropometric (weight, height and body mass index) and disease control data were collected. Lung function (spirometry), cardiopulmonary exercise testing (CPET) and exercise-induced bronchoconstriction (EIB) test were performed.

Results: Twenty-four patients aged 11.5 ± 2.6 years were included. The mean forced expiratory volume in one second (FEV₁) was 91.3 ± 9.2%. EIB occurred in 54.2% of patients. In CPET, the peak oxygen uptake (VO_{2peak}) was 34.1 ± 7.8 mL · kg⁻¹ · min⁻¹. A significant correlation between ventilatory reserve and FEV₁ ($r = 0.57$; $p = 0.003$) was found. Similarly, there was a significant correlation between CPET and percent of FEV₁ fall in the EIB test for both V_E/VO₂ ($r = 0.47$; $p = 0.02$) and V_E/VCO₂ ($r = 0.46$; $p = 0.02$). Patients with FEV₁ < 80% had lower ventilatory reserve ($p = 0.009$). In addition, resting heart rate correlated with VO_{2peak} ($r = -0.40$; $p = 0.04$), V_E/VO₂ ($r = 0.46$; $p = 0.02$) and V_E/VCO₂ ($r = 0.48$; $p = 0.01$).

Conclusions: Exercise capacity is impaired in approximately 30% of children and adolescents with STRA. The results indicate that different aspects of aerobic fitness are influenced by distinct determinants, including lung function and EIB.

ARTICLE HISTORY

Received 22 July 2020
Revised 10 September 2020
Accepted 4 October 2020

KEYWORDS

Aerobic fitness;
exercise-induced
bronchoconstriction; oxygen
consumption; lung function;
cardiopulmonary
exercise testing

Introduction

Asthma is a chronic obstructive respiratory disease that has a high prevalence among children and is considered a leading cause of hospitalization worldwide (1). Regarding disease severity, 5 to 10% of asthmatic patients have severe asthma (2,3), requiring high-dose prophylactic medication, such as inhaled corticosteroids, with variable response to drug therapy. A subset of children with severe asthma not responding adequately to treatment and not controlled despite best available clinical management has been classified as having severe therapy-resistant asthma (STRA) (4). Children with STRA have recurrent wheeze, cough, shortness of breath, disturbed sleep due to symptoms, continued use of medication, frequent emergency department visits and hospitalizations, missed school days and difficulty performing physical activities (5–7).

Reduced exercise tolerance is an important component of the disease that appears to be related to factors such as the degree of resting airflow obstruction, decreased ventilatory capacity, greater perceived dyspnea, and the occurrence of exercise-induced bronchoconstriction (EIB). These factors may contribute to premature cessation of physical activity, leading to a more sedentary lifestyle (5–8). However, it remains unclear which mechanisms are associated with the level of physical fitness in patients with STRA. Therefore, the assessment of exercise capacity is an important tool to objectively measure exercise intolerance, allowing for a safe and individualized exercise prescription (6,9). Cardiopulmonary exercise testing (CPET) is considered the gold standard for assessing exercise capacity, providing objective information on the level of physical fitness and the main determinants of exercise intolerance (10). Previous studies have also

MeSH terms

- Adolescent
- Asthma / diagnosis
- Asthma / drug therapy
- Asthma / physiopathology*
- Child
- Cross-Sectional Studies
- Exercise Test / methods
- Exercise Tolerance* / physiology
- Forced Expiratory Volume
- Humans

CONTACT Márcio Vinícius Fagundes Donadio  mdonadio@pucrs.br  Laboratory of Pediatric Physical Activity, Centro Infant, Av. Ipiranga, 6690, 2º andar, Rio Grande do Sul, CEP 90610-000, Porto Alegre, Brazil.

© 2020 Taylor & Francis Group, LLC

n=2852

MEDLINE via Web of Science Complete

DOCUMENTS		RESEARCHERS
Search in: MEDLINE® ▾		
<u>DOCUMENTS</u>		
MeSH Major Topics ▾	Example: Follicular Cyst/congenital asthma*  	
⊖ And ▾	Age Group ▾	Child: 6-12 years 
⊖ And ▾	Title ▾	Example: water consum* exercis* or train* or perform* or rehab* or therap* 
+ Add row + Add date range Advanced search		× Clear Search

n=1329

DOCUMENTS		RESEARCHERS
Search in: MEDLINE® ▾		
<u>DOCUMENTS</u>		
Title ▾	Example: water consum* asthma* ×	
⊖ And ▾	Title ▾	Example: water consum* child* ×
⊖ And ▾	Title ▾	Example: water consum* exercis* or train* or perform* or rehab* or therap* ×
+ Add row + Add date range Advanced search		× Clear Search

n=321

DOCUMENTS		RESEARCHERS
Search in: MEDLINE® ▾		
<u>DOCUMENTS</u>		
MeSH Major Topics ▾	Example: Follicular Cyst/congenital asthma*  	
And ▾	Topic ▾	Example: Neurodegeneration child* 
And ▾	Topic ▾	Example: Neurodegeneration exercis* near/3 (train* or perform* or rehab* or therap*) 
+ Add row + Add date range Advanced search		× Clear Search

n=276

DOCUMENTS		RESEARCHERS
Search in: MEDLINE® ▾		
<u>DOCUMENTS</u>		
MeSH Major Topics ▾	Example: Follicular Cyst/congenital asthma  	
⊖ And ▾	MeSH Major Topics ▾	Example: Follicular Cyst/congenital exercise or rehabilitation or training  
⊖ And ▾	Age Group ▾	Child: 6-12 years 
⊖ And ▾	Topic ▾	Example: Neurodegeneration human 
+ Add row + Add date range		Advanced search
		× Clear Search

n=181

DOCUMENTS		RESEARCHERS
Search in: MEDLINE® ▾		
<u>DOCUMENTS</u>		
Topic ▾	Example: Neurodegeneration asthma same physiology ✕	
And ▾	Age Group ▾	Child: 6-12 years ✕
And ▾	MeSH Heading ▾	Example: Clonal evolution exercise or train* or rehab* or therap* or perform*  ✕
+ Add row	+ Add date range	Advanced search
		✕ Clear Search

222 results from MEDLINE® for:

Q #1 OR #22 OR #23

Analyze Results

Create Alert

Refined By: Publication Years: 2023 or 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 or 2014 or 2013 or 2012 or 2011 or 2010 or 2009 or 2008 or 2007 or 2006 or 2005 or 2004 or 2003 or 2001 or 2000 X

Publication Type: Journal Article or Review Article X

Languages: English X

MeSH Qualifiers: Physiology or Physiopathology or Diagnosis or Therapy X

Clear all

Publications

You may also like...

Copy query link

Refine results

Search within topic...



Filter by Marked List



Quick Filters

- ☐ Review Article 44
- ☐ Open Access 101
- ☐ Associated Data 4

Publication Years ⓘ



- ☐ 2023 3
- ☐ 2022 3
- ☐ 2021 4
- ☐ 2020 12
- ☐ 2019 15

See all >

2/222

Add To Marked List

Export ▾

Sort by: Usage (last 180 days): most first ▾

< 1 of 5 >

✓ 1 Exercise rehabilitation in pediatric asthma: A systematic review and network meta-analysis.



Jiang, Jing; Zhang, Dong; (...); Zhang, Wei

2022-12 | Pediatric pulmonology 57 (12) , pp.2915-2927

OBJECTIVE: This systematic review delineates various exercise-based pulmonary rehabilitation (PR) designs and quantifies how they may be optimized in pediatric asthma treatment.

DESIGN: Comprehensive systematic review, network meta-analysis, and quality analyses using PubMed, Embase, Cochrane L ... Show more

Find it @ Brock View full text ...

1

Citation

43

References

Related records ?

✓ 2 The impact of exercise on asthma.



Lang, Jason E

2019-04 | Current opinion in allergy and clinical immunology 19 (2) , pp.118-125

PURPOSE OF REVIEW: Asthma is one of the most common chronic diseases in children and adults in developed countries around the world. Despite international treatment guidelines, poor asthma control remains a frequent problem leading to missed school and work, and emergency room visits and hospitalizations. Many patients with asthma report exercise as a trigger for their asthma, which likely lead ... Show more

Find it @ Brock Full Text at Publisher ...

34

Citations

42

References

Related records

222 results from MEDLINE® for:

Analyze Results

Create Alert

Refined By: Publication Years: 2023 or 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 or 2014 or 2013 or 2012 or 2011 or 2010 or 2009 or 2008 or 2007 or 2006 or 2005 or 2004 or 2003 or 2001 or 2000 X

Publication Type: Journal Article or Review Article X Languages: English X MeSH Qualifiers: Physiology or Physiopathology or Diagnosis or Therapy X Clear all

Publications You may also like...



Refine results

Filter by Marked List ^

Quick Filters

- ☐ Review Article 44
- ☐ Open Access 101
- ☐ Associated Data 4

Publication Years ⓘ v

- ☐ 2023 3
- ☐ 2022 3
- ☐ 2021 4
- ☐ 2020 12
- ☐ 2019 15

See all >

1/222 Add To Marked List Export v Sort by: Relevance v < 1 of 5 >

☐ 1

Swimming for children and adolescents with asthma.

Geiger, Katharina R and Henschke, Nicholas

2015-jun | British journal of sports medicine 49 (12) , pp.835-6

Find it @ Brock Full Text at Publisher View Full Text on ProQuest ...

10 Citations
3 References
Related records ?

☒ 2

The impact of exercise on asthma.

Lang, Jason E

2019-04 | Current opinion in allergy and clinical immunology 19 (2) , pp.118-125

PURPOSE OF REVIEW: Asthma is one of the most common chronic diseases in children and adults in developed countries around the world. Despite international treatment guidelines, poor asthma control remains a frequent problem leading to missed school and work, and emergency room visits and hospitalizations. Many patients with asthma report exercise as a trigger for their asthma, which likely lead ... Show more

Find it @ Brock Full Text at Publisher ...

34 Citations
42 References
Related records

222 results from MEDLINE® for:

Q #1 OR #22 OR #23

Analyze Results

Create Alert

Refined By: Publication Years: 2023 or 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 or 2014 or 2013 or 2012 or 2011 or 2010 or 2009 or 2008 or 2007 or 2006 or 2005 or 2004 or 2003 or 2001 or 2000 X

Publication Type: Journal Article or Review Article X

Languages: English X

MeSH Qualifiers: Physiology or Physiopathology or Diagnosis or Therapy X

Languages: English X

Clear all

Publications

You may also like...

Copy query link

Refine results

Search within topic...



Filter by Marked List

Quick Filters

- ☐ Review Article 44
- ☐ Open Access 101
- ☐ Associated Data 4

Publication Years ⓘ

- ☐ 2023 3
- ☐ 2022 3
- ☐ 2021 4
- ☐ 2020 12
- ☐ 2019 15

See all >

0/222

Add To Marked List

Export ▾

Sort by: Date: newest first ▾

< 1 of 5 >

- ☐ 1 Advances in pulmonary rehabilitation for children with bronchial asthma.



支气管哮喘患儿肺康复临床研究进展.

Qian, Kongjia; Xu, Hongzhen; (...); Zheng, Ying

2023-aug-25 | Zhejiang da xue xue bao. Yi xue ban = Journal of Zhejiang University. Medical sciences 52 (4) , pp.518-525

Bronchial asthma is a heterogeneous disease characterized by chronic airway inflammation and airway hyperresponsiveness. With the development of the whole-life-cycle health concept, the focus of treatment for bronchial asthma in children has gradually shifted from pharmacological control to an integrated management model of functional rehabilitation and pharmacological assistance. As a non-phar ... Show more

Find it @ Brock Free Published Article From Repository View full text ...

58

References

Related records ⓘ

- ☐ 2 The effect of pulmonary rehabilitation on childhood asthma: a systematic review and meta-analysis.

Jin, Guoping; Jiang, Yuan; (...); Zhu, Jihua

2023-aug | Minerva pediatrics 75 (4) , pp.604-613

INTRODUCTION: Pulmonary rehabilitation (PR) is a comprehensive nursing intervention for lung function improvement in patients with respiratory diseases. This systematic review focused on further exploration of the unclear impacts of PR on childhood asthma.

EVIDENCE ACQUISITION: Web of Science, Cochrane Library, Embase, PubMed, and other databases were searched until May 2 ... Show more

Find it @ Brock View full text ...

0

References



Refine results



Filter by Marked List



Quick Filters

- ☐ Review Article 44
- ☐ Open Access 101
- ☐ Associated Data 4

Publication Years



- ☐ 2023 3
- ☐ 2022 3
- ☐ 2021 4
- ☐ 2020 12
- ☐ 2019 15

[See all >](#)

☐ 0/222

[Add To Marked List](#)

[Export](#) ▾

Sort by: Citations: highest first ▾



1

of 5



- ☐ 1 [Physical activity and exercise in asthma: relevance to etiology and treatment.](#)



[Lucas, Sean R](#) and [Platts-Mills, Thomas A E](#)



2005-may | [The Journal of allergy and clinical immunology](#) 115 (5) , pp.928-34

There is little doubt that the cause of the increased prevalence and severity of asthma is multifactorial. Although the factors of allergen exposure and hygiene are almost certainly necessary for its development, there is a growing body of literature that implicates lifestyle change, specifically decreased physical activity, as a contributor to the increase in asthma prevalence and severity. See ... [Show more](#)

[Find it @ Brock](#) [Full Text at Publisher](#) ...

163

[Citations](#)

44

[References](#)

[Related records ?](#)

- ☐ 2 [Exercise-induced dyspnea in children and adolescents: if not asthma then what?](#)



[Abu-Hasan, Mutasim](#); [Tannous, Beatrice](#) and [Weinberger, Miles](#)

2005-mar | [Annals of allergy, asthma & immunology : official publication of the American College of Allergy, Asthma, & Immunology](#) 94 (3) , pp.366-71

BACKGROUND: Exercise-induced dyspnea (EID) in children and adolescents is a common manifestation of asthma and is therefore commonly attributed to exercise-induced asthma (EIA) when present in otherwise healthy children.

OBJECTIVE: To report the outcome of evaluations for EID when other symptoms and signs of asthma were absent or if there v ... [Show more](#)

[Find it @ Brock](#) [Full Text at Publisher](#) ...

140

[Citations](#)

43

[References](#)

[Related records](#)

12 results in MEDLINE®

[Analyze Results](#)

Refine results

Search within list for...



Marked List results

☒ MEDLINE® 12

Filter by Marked List

Quick Filters

- ☐ Review Article 6
- ☐ Open Access 6
- ☐ Associated Data 1

Publication Years ⓘ

- ☐ 2023 1
- ☐ 2022 1
- ☐ 2020 1
- ☐ 2014 1
- ☐ 2012 1

[See all >](#)

Publication Type

- ☐ Journal Article 12
- ☐ Review Article 6
- ☐ Systematic Review 5
- ☐ Meta Analysis 3
- ☐ Randomized Controlled Trial 2

☐ 0/12[Remove](#)[Export ▾](#)

Sort by: Citations: highest first ▾

< 1 of 1 >

☐ 1 [Physical activity and exercise in asthma: relevance to etiology and treatment.](#)

163

[Citations](#)[Lucas, Sean R](#) and [Platts-Mills, Thomas A E](#)2005-may | [The Journal of allergy and clinical immunology](#) 115 (5) , pp.928-34

44

[References](#)

There is little doubt that the cause of the increased prevalence and severity of asthma is multifactorial. Although the factors of allergen exposure and hygiene are almost certainly necessary for its development, there is a growing body of literature that implicates lifestyle change, specifically decreased physical activity, as a contributor to the increase in asthma prevalence and severity. Se ... [Show more](#)

[Find it @ Brock](#) [Full Text at Publisher](#) ...[Related records ?](#)☐ 2 [Exercise-induced dyspnea in children and adolescents: if not asthma then what?](#)

140

[Citations](#)[Abu-Hasan, Mutasim; Tannous, Beatrice](#) and [Weinberger, Miles](#)2005-mar | [Annals of allergy, asthma & immunology : official publication of the American College of Allergy, Asthma, & Immunology](#) 94 (3) , pp.366-71

43

[References](#)

BACKGROUND: Exercise-induced dyspnea (EID) in children and adolescents is a common manifestation of asthma and is therefore commonly attributed to exercise-induced asthma (EIA) when present in otherwise healthy children.
OBJECTIVE: To report the outcome of evaluations for EID when other symptoms and signs of asthma were absent or if there v ... [Show more](#)

[Find it @ Brock](#) [Full Text at Publisher](#) ...[Related records](#)☐ 3 [Exercise training on disease control and quality of life in asthmatic children.](#)

138

[Citations](#)[Fanelli, Adriana; Cabral, Anna Lucia Barros; \(...\); Carvalho, Celso Ricardo Fernandes](#)2007-sep | [Medicine and science in sports and exercise](#) 39 (9) , pp.1474-80

29

[References](#)

PURPOSE: Aerobic training has been shown to be effective in improving cardiopulmonary fitness in asthmatic children. However, the actual impact of physical training on clinical indicators of disease control remains controversial.
METHODS: Thirty-eight children with moderate to severe persistent asthma were randomly assigned to control (N=17) and tr ... [Show more](#)

[Find it @ Brock](#) [Free Full Text From Publisher](#) ...[Related records](#)



Effect of physical activity on asthma control in schoolchildren.

By Santos, Ana Paula Dos; Strassburger, Marcio Junior; Roncada, Cristian; Stein, Renato Tetelbom; Pitrez, Paulo Marcio; Strassburger, Simone Zeni

[View Web of Science ResearcherID and ORCID](#) (provided by Clarivate)

Source

Einstein (Sao Paulo, Brazil)

Volume: 18 Page: eAO4936

DOI: [10.31744/einstein_journal/2020AO4936](https://doi.org/10.31744/einstein_journal/2020AO4936)

Published

2019-11-07 2020

Indexed

2019-12-19

Document Type

Journal Article; Observational Study

Abstract

OBJECTIVE: Santos, A. P. D., Strassburger, M., Roncada, C., Stein, R. T., Pitrez, P. M., & Strassburger, S. Z. (2019). Effect of physical activity on asthma control in schoolchildren. *Einstein* (São Paulo), 18, eAO4936.

METHODS: A cross-sectional study was conducted with schoolchildren and a medical history of asthma. The study aimed to evaluate the effect of physical activity on asthma control.

RESULTS: A total of 482 schoolchildren with asthma participated in the study, with mean age of 10.9±2.2 years, and 253 (52%) were girls. Regarding disease control, 50% had controlled asthma, and 67% were considered sedentary. Schoolchildren with controlled asthma were more active than those with uncontrolled asthma (p=0.032). Active schoolchildren were more likely to have asthma controlled (OR=1.5; 95%CI: 1.04-2.25).

CONCLUSION: The results demonstrated an association between physical activity levels and asthma control. More active schoolchildren were more likely to have asthma controlled.

Citation Network

In Web of Science Core Collection

6 Citations

[Create citation alert](#)

6 Times Cited in All Databases
[+ See more times cited](#)

37 Cited References
[View Related Records →](#)

[View PubMed related articles →](#)

*PUBLIC OF CHILDREN AND YOUTHS WITH
ASTHMA: A LITERATURE REVIEW*
REVISTA CIENTIFICA DA FACULDADE DE
EDUCACAO E MEIO AMBIENTE

Lee, S; Zhang, A; Wang, LY; et al.
[Changes in physical activity and sedentary
time among children with asthma during the](#)

How to cite this article:

Santos AP, Strassburger MJ, Roncada C, Stein RT, Pitrez PM, Strassburger SZ. Effect of physical activity on asthma control in schoolchildren. *einstein* (São Paulo). 2020;18:eAQ4936. http://dx.doi.org/10.31744/einstein_journal/2020AQ4936

Corresponding author:

Simone Zeni Strassburger
Rua do Comércio, 3.000 – Bairro Universitário
Zip code: 98700-000 – Ijuí, RS, Brazil
Phone: (55 55) 3332-0461
E-mail: simone.s@unijui.edu.br

Received on:

Jan 9, 2019

Accepted on:

June 25, 2019

Conflict of interest:

none.

Copyright 2019

This content is licensed
under a Creative Commons
Attribution 4.0 International License.

Effect of physical activity on asthma control in schoolchildren

Efeito da atividade física no controle da asma em escolares

Ana Paula dos Santos¹, Márcio Júnior Strassburger¹, Cristian Roncada², Renato Tetelborn Stein³, Paulo Márcio Pitrez², Simone Zeni Strassburger¹

¹ Universidade Regional do Noroeste do Estado do Rio Grande do Sul, Ijuí, RS, Brazil.

² Centro Universitário da Serra Gaúcha, Caxias do Sul, RS, Brazil.

³ Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS, Brazil.

DOI: 10.31744/einstein_journal/2020AQ4936

ABSTRACT

Objective: To investigate the effect of levels of physical activity on asthma control in children.

Methods: A cross-sectional study, including public school students aged 8 to 12 years, of both sexes, with asthma, from a capital and a medium-sized cities in Southern Brazil. At home, the students answered the questionnaire on levels of physical activity and disease control. **Results:** A total of 482 schoolchildren with asthma participated in the study, with mean age of 10.9 ± 2.2 years, and 253 (52%) were girls. Regarding disease control, 50% had controlled asthma, and 67% were considered sedentary. Schoolchildren with controlled asthma were more active than those with uncontrolled asthma ($p=0.032$). Active schoolchildren were more likely to have asthma controlled (OR=1.5; 95%CI: 1.04-2.25). **Conclusion:** The results demonstrated an association between physical activity levels and asthma control. More active schoolchildren were more likely to have asthma controlled.

Keywords: Asthma; Exercise; Sedentary behavior; Child; Adolescent

RESUMO

Objetivo: Investigar o efeito dos níveis de atividade física no controle da asma em crianças.

Métodos: Estudo transversal, incluindo escolares da rede pública, de 8 a 12 anos, de ambos os sexos, com asma, de uma capital e de uma cidade de porte médio da Região Sul do Brasil. Os escolares responderam, em seus domicílios, um questionário de níveis de atividade física e de controle da doença. **Resultados:** Participaram da pesquisa 482 escolares com asma, com média de idade de $10,9 \pm 2,2$ anos, e 253 (52%) eram meninas. Quanto ao controle da doença, 50% apresentavam asma controlada e 67% foram considerados sedentários. Os escolares com asma controlada foram mais ativos do que os com asma não controlada ($p=0,032$). Os escolares ativos tiveram mais chance de ter a asma controlada (RC=1,5; IC95%: 1,04-2,25). **Conclusão:** Os resultados demonstraram associação entre os níveis de atividade física e controle da asma. Os escolares mais ativos apresentaram mais chance de ter a asma controlada.

Descritores: Asma; Exercício; Comportamento sedentário; Criança; Adolescente

INTRODUCTION

Asthma is considered the most prevalent chronic disease in the pediatric age groups, affecting from 8.7 to 30.8% of this population in different Latin American countries.⁽¹⁾ Due to its multifactorial etiology, compliance with treatment and control of the disease can be influenced by various factors.^(1,2) Absence of adequate control results in exacerbations and hospitalizations. In Brazil, there are approximately 110 hospitalizations for every 100 thousand

MeSH terms

- Adolescent
- Asthma / prevention & control*
- Brazil
- Child
- Cross-Sectional Studies
- Exercise / physiology*
- Female
- Humans
- Male
- Sedentary Behavior
- Socioeconomic Factors
- Students / statistics & numerical data*
- Surveys and Questionnaires

https://zbib.org/

zotero**bib**

10.31744/einstein_journal/2020AO4936

Cite

Manual Entry

Santos, A. P. D., Strassburger, M., Roncada, C., Stein, R. T., Pitrez, P. M., & Strassburger, S. Z. (2019). Effect of physical activity on asthma control in schoolchildren. *Einstein (São Paulo)*, 18, eAO4936. https://doi.org/10.31744/einstein_journal/2020AO4936

Close

Delete

Edit

Bibliography

American Psychological Association 7th edition





Joyce

kacey

kaitlyn

▼ Kendra

articles Nov 2023

Epistemonikos database

OSF

review articles Nov 2023

reviews for consideration

theses Nov 2023

▼ Kiev

reviews

theses dissertations

KINE 1P93

KINE 2P91

KINE 4P84 asthma

KINE hon students

KINE stuff

▼ Lauren

seed papers

▼ Lauren

articles

madeleine

marco

Maria

maryam

Math article

▼ Matt

*Asthma

*Asthma/pp [Physiopathology]

*Asthma/rh [Rehabilitation]

^

Title

Can physical exercise assist in controlling and reducing the severity of exercise-induced bronchospasm ...

> Comparison of physical fitness between healthy and mild-to-moderate asthmatic children with exercise...

> Determinants of exercise capacity in children and adolescents with severe therapy-resistant asthma.

> Effect of 8 Weeks of Incremental Aerobic Training on Inflammatory Mediators, Cardiorespiratory Indices...

> Effect of exercise rehabilitation on exercise capacity and quality of life in children with bronchial asthma...

Effect of physical activity on asthma control in schoolchildren.

Effects of physical conditioning on children and adolescents with asthma.

Effects of physical exercise on quality of life, exercise capacity and pulmonary function in children with ...

> Effects of physical therapy on lung function in children with asthma: a systematic review and meta-anal...

Effects of physical training in asthma: a systematic review.

Exercise rehabilitation in pediatric asthma: A systematic review and network meta-analysis.

Exercise training in children with asthma: a systematic review.

Exercise training on disease control and quality of life in asthmatic children.

Exercise-induced dyspnea in children and adolescents: if not asthma then what?

> Perceived exercise limitation in asthma: The role of disease severity, overweight, and physical activity in ...

Physical activity and asthma: a systematic review and meta-analysis.

Physical activity and exercise in asthma: relevance to etiology and treatment.

> Physical activity and quality of life in children with well-controlled asthma.

> Physical activity experiences of children and adolescents with asthma: a qualitative systematic review pr...

> Physical therapy and lung function in children with asthma: is it helpful?

> Responses to Physical Activity Among Children and Youths with Exercise-Induced ASTHMA.

The beneficial effects of physical exercise on antioxidant status in asthmatic children.

▼

^

Info

Notes

Tags

Related

Item Type

Journal Article

Title

Effect of physical activity on asthma control in schoolchildren.

▼ Author

Santos, Ana Paula Dos

▼ Author

Strassburger, Marcio Junior

▼ Author

Roncada, Cristian

▼ Author

Stein, Renato Tetelbom

▼ Author

Pitrez, Paulo Marcio

▼ Author

Strassburger, Simone Zeni

(...) Abstract

OBJECTIVE: To investigate the effect of levels of...

Publication

Einstein (Sao Paulo, Brazil)

Volume

18

Issue

Pages

eAO4936-eAO4936

Date

2020

Series

Series Title

Series Text

Journal Abbr

Language

DOI

10.31744/einstein_journal/2020AO4936

ISSN

Short Title

URL

Accessed

Archive

Loc. in Archive

MEDLINE:31721896

Academic Search Complete, AgeLine, [BASE](#), BioOne Complete, [bioRxiv](#), CINAHL Complete, [CORE](#), [Dimensions](#), [Directory of Open Access Journals \(DOAJ\)](#), Education Source, [Elicit](#), Embase, [figshare](#), Gender Studies Database, [Google](#), [Advanced Google](#), [Google Books](#), [Google Scholar](#), [Keenious](#), [MEDLINE via PubMed](#), MEDLINE via OVID, MEDLINE via Web of Science Complete, Omni, [Open Alex](#), [ORCID](#), [OSF Preprints](#), Oxford Reference, [Paperity](#), [PLOS](#), Politics Collection, ProQuest Sociology Collection, PsycINFO, [ResearchGate](#), [ResearchRabbit](#), Scholars Portal E-Journals, [SciELO](#), [Scite](#), [Scilit](#), ~~Scopus~~, [Semantic Scholar](#), Sport Discus, [The Lens](#), Web of Science Core Collection, [WorldWideScience.org](#), [WorldCat](#), [Zenodo](#)...

MEDLINE, Embase, Web of Science Core Collection, Sport Discuss, Education Source, PsycINFO, Academic Search Complete...

MEDLINE via [PubMed](#), via Web of Science Complete...



Find papers

What role does exercise have with treating asthma?

Searching 200 million academic papers

Summarizing the first 4 abstracts

Results

Summary of top 4 papers

Copy

Exercise plays a crucial role in the management of asthma, with potential disease-modifying benefits (Freeman, 2020). It can improve asthma control, symptoms, and quality of life, particularly in children and adults (Lang, 2019). However, exercise can also trigger asthma, requiring tailored treatment for each patient (Storms, 2005). Individualized exercise programs, including medically supervised training, can significantly improve cardiovascular fitness and reduce breathlessness (Clark, 1992). Therefore, while exercise can be a valuable tool in asthma management, it should be approached with caution and tailored to the individual's needs.

+ Add columns

Sort

Filters

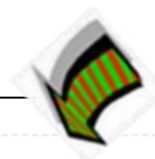
Paper	Abstract summary
Defining a role for exercise training in the management of asthma A. Freeman +2 European Respiratory Review 2020 10 citations DOI	Exercise can modulate inflammatory and immune processes in asthma.
Asthma associated with exercise. William W Storms Immunology and allergy clinics of North America 2005 44 citations DOI	Exercise is a potent stimulus to asthma.
The impact of exercise on asthma J. Lang Current Opinion in Allergy and Clinical Immunology 2019 34 citations DOI	Exercise appears to favor improvements in aerobic fitness, asthma symptoms, and quality of life.
The role of physical training in asthma. C. J. Clark Chest 1992 60 citations DOI	Medically supervised training can significantly improve cardiovascular fitness variables and submaximal ventilatory and metabolic responses in individuals with asthma.

Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

MEDLINE – via Web of Science Complete

- Produced by the U.S. National Library of Medicine (NLM), the MEDLINE database is widely recognized as the premier source for bibliographic and abstract coverage of the biomedical, biomedicine and health research literature. MEDLINE indexes over 18 million references to articles from over 5,500 newspapers, newsletters and magazines including 1,500 core journals. MEDLINE covers research topics in biology, environmental science, plant and animal science, marine biology , chemistry, biophysics and related intradisciplinary fields. MEDLINE accommodates keyword searching while facilitating the use of MeSH Thesaurus controlled vocabulary, headings, qualifiers and major topics. MEDLINE via Web of Knowledge provides a unique ability to analyze and refine search results, sort records, save search histories, utilize EndNote Web and Refworks bibliographic management tools and create customized citation alerts that automatically sends citations of interest to your email account.
- Coverage: 1950–current ; updated weekly.
- [Permitted Uses](#)



MEDLINE – via PubMed

Alumni Access

Open Access

- Full version of MEDLINE with access to the MESH thesaurus.
- Coverage: 1966–current
- [Terms of Use from Publisher Site](#)

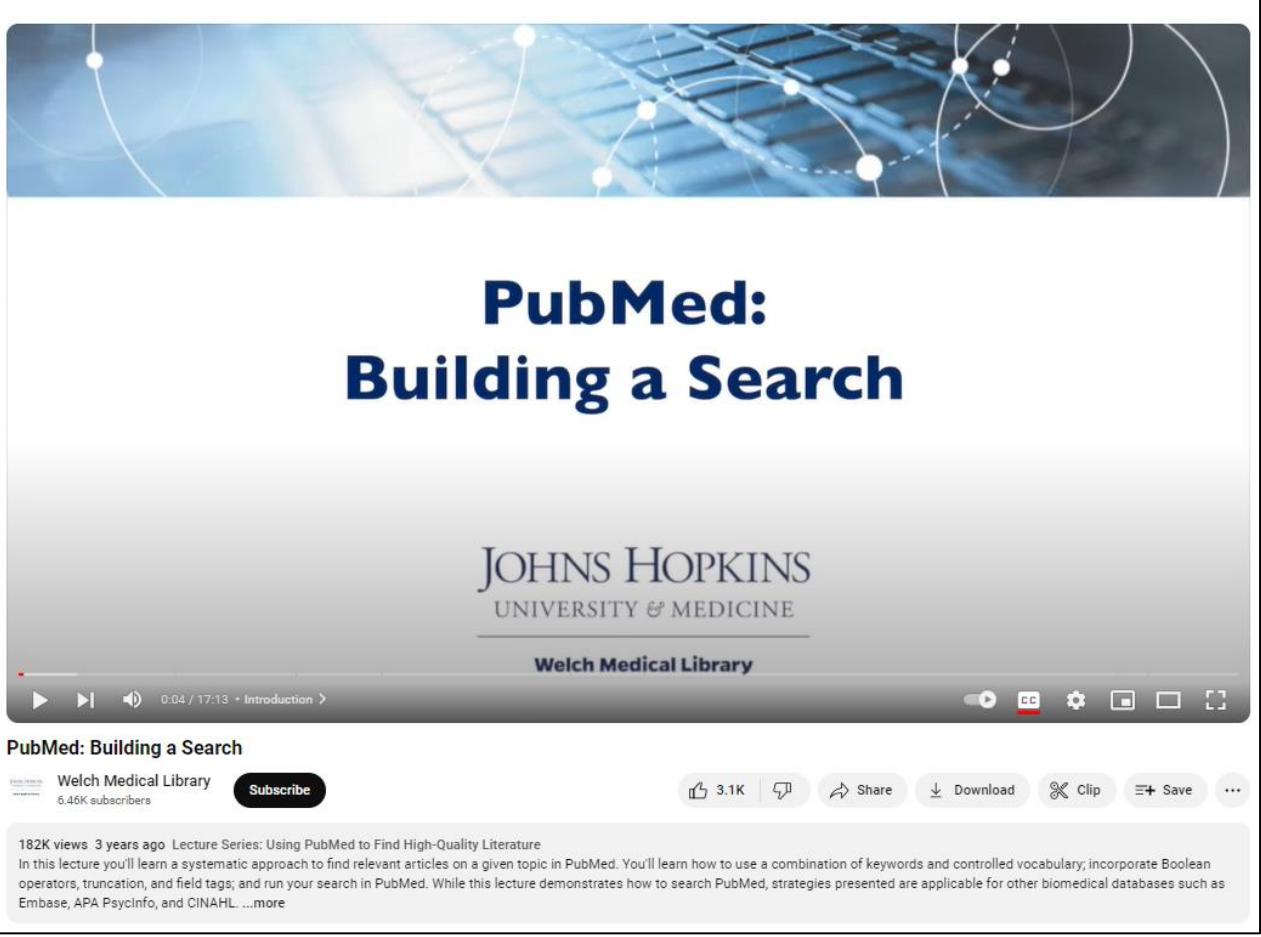
MEDLINE – via OVID

- International literature on biomedicine, allied health fields and biological and physical sciences, humanities, and information science as they relate to medicine and health care.
- Coverage: 1946–current
- [Permitted Uses](#)

Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

PubMed: Building a Search (John Hopkins Welch Medical Library, 2022, YouTube, 17:13)
<https://www.youtube.com/watch?v=xGYFDrORpzA>



The image shows a YouTube video player interface. At the top is a blue header with a network diagram. The main title "PubMed: Building a Search" is in large blue font. Below it is the Johns Hopkins University & Medicine logo and the Welch Medical Library name. The video player controls show a progress bar at 0:04 / 17:13. Below the player, the video title "PubMed: Building a Search" is repeated, followed by the channel name "Welch Medical Library" with 6.46K subscribers and a "Subscribe" button. To the right are icons for likes (3.1K), comments, shares, downloads, clips, and saves. A description box at the bottom states: "182K views · 3 years ago · Lecture Series: Using PubMed to Find High-Quality Literature. In this lecture you'll learn a systematic approach to find relevant articles on a given topic in PubMed. You'll learn how to use a combination of keywords and controlled vocabulary; incorporate Boolean operators, truncation, and field tags; and run your search in PubMed. While this lecture demonstrates how to search PubMed, strategies presented are applicable for other biomedical databases such as Embase, APA PsycInfo, and CINAHL. ...more".

PubMed: Building a Search

JOHNS HOPKINS
UNIVERSITY & MEDICINE

Welch Medical Library

0:04 / 17:13 · Introduction >

PubMed: Building a Search

Welch Medical Library
6.46K subscribers

Subscribe

3.1K | | Share | Download | Clip | Save | ...

182K views · 3 years ago · Lecture Series: Using PubMed to Find High-Quality Literature

In this lecture you'll learn a systematic approach to find relevant articles on a given topic in PubMed. You'll learn how to use a combination of keywords and controlled vocabulary; incorporate Boolean operators, truncation, and field tags; and run your search in PubMed. While this lecture demonstrates how to search PubMed, strategies presented are applicable for other biomedical databases such as Embase, APA PsycInfo, and CINAHL. ...more

https://pubmed.ncbi.nlm.nih.gov/





National Library of Medicine
National Center for Biotechnology Information

[Log in](#)

PubMed®

Search

Advanced

PubMed® comprises more than 36 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.



Learn
[About PubMed](#)
[FAQs & User Guide](#)
[Finding Full Text](#)



Find
[Advanced Search](#)
[Clinical Queries](#)
[Single Citation Matcher](#)



Download
[E-utilities API](#)
[FTP](#)
[Batch Citation Matcher](#)



Explore
[MeSH Database](#)
[Journals](#)

<https://pubmed.ncbi.nlm.nih.gov/help/>

 **National Library of Medicine**
National Center for Biotechnology Information

 **PubMed**[®]

Search

Advanced

PubMed User Guide

Last update: December 12, 2023

Follow [PubMed New](#) and [Noteworthy](#) for brief announcements highlighting recent enhancements and changes to PubMed.

FAQs

- Where can I find [FAQs about the transition to new PubMed](#) and retirement of the legacy system?
- How can I [get the full text article](#)? What if the [link to the full text](#) is not working?
- How do I [search by author](#)?
- How do I [search by journal name](#)?
- How do I [find a specific citation](#)? I have some information such as the author, journal name, and publication year.
- I retrieved too many citations. [How can I focus my search](#)?
- I retrieved too few citations. [How can I expand my search](#)?
- How do I find [consumer health](#) information about a disease or condition?
- How do I find [systematic reviews](#)?
- Are there tools to help with [clinical searches](#) or finding [medical genetics](#) information?
- I'm not finding what I need. [How does a PubMed search work](#)?
- Can you explain what is shown on the search results?
- How do I [display an abstract](#)?
- How can I [save my results](#)?
- Can I [receive email updates](#) when new results are available for my search?

PAGE NAVIGATION

[< FAQs](#)

[Search PubMed](#)

[Display, sort and navigate](#)

[Cite, save, and share](#)

[Advanced Search](#)

[Other services](#)

[Appendices](#)

<https://pubmed.ncbi.nlm.nih.gov/help/>

Search PubMed

- [How do I search PubMed?](#)
- [I retrieved too many citations. How can I focus my search?](#)
- [I retrieved too few citations. How can I expand my search?](#)
- [Find a specific citation](#)
- [Searching by author](#)
- [Searching by journal](#)
- [Searching by date](#)
- [Filters](#)
- [Searching for a phrase](#)
- [Truncating search terms](#)
- [Combining search terms with Boolean operators \(AND, OR, NOT\)](#)
- [Using search field tags](#)
- [Proximity searching](#)

<https://pubmed.ncbi.nlm.nih.gov/?otool=icabrkulib>

<https://pubmed.ncbi.nlm.nih.gov/advanced/>

**National Library of Medicine**
National Center for Biotechnology Information

Log in

PubMed Advanced Search Builder




[User Guide](#)

Add terms to the query box

All Fields

Enter a search term

ADD

[Show Index](#)

Query box

Enter / edit your search query here

Search

History and Search Details

Download

Delete

Search	Actions	Details	Query	Results	Time
#1	...	>	Search: spong	632	14:21:08

Showing 1 to 1 of 1 entries

- Full version of MEDLINE with access to the MESH thesaurus.
- Coverage: 1966-current
- [Terms of Use from Publisher Site](#)



National Library of Medicine

National Center for Biotechnology Information

Log in

PubMed Advanced Search Builder



[User Guide](#)



Filters applied: English. [Clear all](#)

Add terms to the query box

All Fields



Enter a search term

ADD



[Show Index](#)

Query box

Enter / edit your search query here

Search



History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.

What are the challenges faced by practitioners
treating children with asthma by exercise?

P children

I exercise

C asthma

O healthy

1. [child* age 6-12, MeSH “child”; PsycINFO 6-12, “school age”; Education Source & Sport Discus, age 0-12, “children”]; or “elementary school children” ...
 2. exercise* or perform* or train* or respon* or “physical fitness” or rehab* or physio* ...
 3. asthma* ~~Asperger Syndrome~~
- challeng* or barrier* or role or roles or outcome* or treatment* or intervention* or approach* or behav*...

What are the challenges faced by practitioners treating children with asthma by exercise?



P children
I exercise
C asthma
O healthy

1. MeSH Heading "Child" OR keyword child*
2. MeSH Major Heading "Exercise" OR keywords [exercis* or perform* or train* or respon* or "physical fitness" or rehab* or physio*]
3. MeSH Major Heading "Asthma" ~~Asperger Syndrome~~

Additional keywords in title, abstracts and indexing: [challeng* or barrier* or role or roles or outcome* or treatment* or intervention* or approach* or behav*]

Article Type: Clinical Trial or Randomized Controlled Trial ~~or Classical Article~~

Article Language: English

Date: 2000 to present

Age: Child 6-12

MeSH

MeSH ▾

Search

[Limits](#) [Advanced](#)

[Help](#)

Full ▾

Send to: ▾

Asthma

A form of bronchial disorder with three distinct components: airway hyper-responsiveness (RESPIRATORY HYPERSENSITIVITY), airway INFLAMMATION, and intermittent AIRWAY OBSTRUCTION. It is characterized by spasmodic contraction of airway smooth muscle, WHEEZING, and dyspnea (DYSPNEA, PAROXYSMAL).

PubMed search builder options

[Subheadings:](#)

- | | | |
|--|---------------------------------------|---|
| ☐ blood | ☐ enzymology | ☐ pathology |
| ☐ cerebrospinal fluid | ☐ epidemiology | ☐ physiopathology |
| ☐ chemically induced | ☐ ethnology | ☐ prevention and control |
| ☐ classification | ☐ etiology | ☐ psychology |
| ☐ complications | ☐ genetics | ☐ radiotherapy |
| ☐ congenital | ☐ history | ☐ rehabilitation |
| ☐ diagnosis | ☐ immunology | ☐ surgery |
| ☐ diagnostic imaging | ☐ metabolism | ☐ therapy |
| ☐ diet therapy | ☐ microbiology | ☐ urine |
| ☐ drug therapy | ☐ mortality | ☐ veterinary |
| ☐ economics | ☐ nursing | ☐ virology |
| ☐ embryology | ☐ parasitology | |

☐ Restrict to MeSH Major Topic.

☐ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C08.127.108, C08.381.495.108, C08.674.095, C20.543.480.680.095

MeSH Unique ID: D001249

PubMed Search Builder

"Asthma" [Mesh]

Add to search builder AND ▾

Search PubMed

 [Tutorial](#)

Related information

[PubMed](#)

[PubMed - Major Topic](#)

[Clinical Queries](#)

[NLM MeSH Browser](#)

[dbGaP Links](#)

[MedGen](#)

Recent Activity

[Turn Off](#) [Clear](#)

 Asthma

MeSH

 [asthma \(13\)](#)

See Also:

- [Anti-Asthmatic Agents](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Respiratory Tract Diseases](#)

[Bronchial Diseases](#)

Asthma

[Asthma-Chronic Obstructive Pulmonary Disease Overlap Syndrome](#)

[Asthma, Aspirin-Induced](#)

[Asthma, Exercise-Induced](#)

[Asthma, Occupational](#)

[Cough-Variant Asthma](#)

[Status Asthmaticus](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Respiratory Tract Diseases](#)

[Lung Diseases](#)

[Lung Diseases, Obstructive](#)

Asthma

[Asthma-Chronic Obs](#)

[Cough-Variant Asthma](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Respiratory Tract Diseases](#)

[Respiratory Hypersensitivity](#)

Asthma

[Asthma-Chronic Obstructive Pulmonary Disease Overlap Syndrome](#)

[Asthma, Aspirin-Induced](#)

[Asthma, Exercise-Induced](#)

[Asthma, Occupational](#)

[Cough-Variant Asthma](#)

[Status Asthmaticus](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Immune System Diseases](#)

[Hypersensitivity](#)

[Hypersensitivity, Immediate](#)

[Respiratory Hypersensitivity](#)

Asthma

[Asthma, Exercise-Induced](#)

[Asthma, Occupational](#)

[Cough-Variant Asthma](#)

[Status Asthmaticus](#)



[Advanced](#) [Create alert](#) [Create RSS](#) [User Guide](#)

Sort by:  



[MY NCBI FILTERS](#) 

144,040 results

  Page of 721  

MeSH exploded
144,040

MeSH

MeSH

Limits Advanced

Search

Help

Full

Send to:

PubMed Search Builder

"Asthma" [Mesh:NoExp]

Add to search builder AND

Search PubMed

Asthma

A form of bronchial disorder with three distinct components: airway hyper-responsiveness (RESPIRATORY HYPERSENSITIVITY), airway INFLAMMATION, and intermittent AIRWAY OBSTRUCTION. It is characterized by spasmodic contraction of airway smooth muscle, WHEEZING, and dyspnea (DYSYPNEA, PAROXYSMAL).

PubMed search builder options

[Subheadings:](#)

- ☐ blood
- ☐ cerebrospinal fluid
- ☐ chemically induced
- ☐ classification
- ☐ complications
- ☐ congenital
- ☐ diagnosis
- ☐ diagnostic imaging
- ☐ diet therapy
- ☐ drug therapy
- ☐ economics
- ☐ embryology

- ☐ enz
- ☐ epid
- ☐ ethr
- ☐ etio
- ☐ gen
- ☐ hist
- ☐ imm
- ☐ met
- ☐ mic
- ☐ mort
- ☐ nursing
- ☐ parasitology

PubMed

"Asthma" [Mesh:NoExp]

Advanced Create alert Create RSS

Search

User Guide

Save

Email

Send to

Sort by: Most recent

Display options

MY NCBI FILTERS

141,107 results

Page 1 of 706

☐ Restrict to MeSH Major Topic.

☒ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C08.127.108, C08.381.495.108, C08.674.095, C20.543.480.680.095

MeSH Unique ID: D001249

MeSH focused
141,107



National Library of Medicine
National Center for Biotechnology Information

Log in

MeSH

MeSH

Search

Limits Advanced

Help

Full

Asthma

A form of bronchial disorder with three distinct components: airway hyper-responsiveness (RESPIRATORY HYPERSENSITIVITY), airway INFLAMMATION, and intermittent AIRWAY OBSTRUCTION. It is characterized by spasmodic contraction of airway smooth muscle, WHEEZING, and dyspnea (DYSPNEA, PAROXYSMAL).

PubMed search builder options

[Subheadings:](#)

☐ blood

☐ cerebrospinal fluid

☐ chemically induced

☐ classification

☐ complications

☐ congenital

☐ diagnosis

☐ diagnostic imaging

☐ diet therapy

☐ drug therapy

☐ economics

☐ embryology

☐ nursing

☐ parasitology

☐ virology

☒ Restrict to MeSH Major Topic.

☐ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C08.127.108, C08.381.495.108, C08.674.095, C20.543.480.680.095
MeSH Unique ID: D001249

Send to:

PubMed Search Builder

"Asthma"[Majr]

Add to search builder AND

Search PubMed



PubMed

"Asthma"[Majr]

Advanced Create alert Create RSS

User Guide

Save Email Send to

Sort by: Most recent

Display options

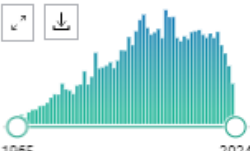
MY NCBI FILTERS

121,044 results

Page 1 of 606

MeSH major
121,044





1965 2024

TEXT AVAILABILITY

☐ Abstract

☐ Free full text

☐ Full text

ARTICLE ATTRIBUTE

☐ Associated data

ARTICLE TYPE

☐ Books and Documents

☒ Clinical Trial

☐ Meta-Analysis

☒ Randomized Controlled Trial

☐ Review

☐ Systematic Review

PUBLICATION DATE

☐ 1 year

☐ 5 years

☐ 10 years

☐ Custom Range

ARTICLE LANGUAGE

☒ English

AGE

☐ Child: 6-12 years

☐ Preschool Child: 2-5 years



ARTICLE TYPE

SPECIES

ARTICLE LANGUAGE

SEX

AGE

OTHER

☐ Address

☐ Autobiography

☐ Bibliography

☐ Biography

☐ Case Reports

☐ Classical Article

☐ Clinical Conference

☐ Clinical Study

☐ Clinical Trial Protocol

☐ Clinical Trial, Phase I

☐ Clinical Trial, Phase II

☐ Clinical Trial, Phase III

☐ Clinical Trial, Phase IV

☐ Clinical Trial, Veterinary

☐ Comment

☐ Introductory Journal Article

☐ Lecture

☐ Legal Case

☐ Legislation

☐ Letter

☐ Multicenter Study

☐ News

☐ Newspaper Article

☐ Observational Study

☐ Observational Study, Veterinary

☐ Overall

☐ Patient Education Handout

☐ Periodical Index

☐ Personal Narrative

☐ Portrait

PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

All Fields



Enter a search term

ADD ▾

[Show Index](#)

Query box

Enter / edit your search query here

Search ▾

Add terms to the query box

All Fields

Affiliation

All Fields

Author

Author - Corporate

Author - First

Author - Identifier

Author - Last

Book

Conflict of Interest Statements

Date - Completion

Date - Create

Date - Entry

Date - MeSH

Date - Modification

Date - Publication

EC/RN Number

Editor

Filter

Grants and Funding

ISBN

asthma*



ADD



[Show Index](#)

Search



Searches will appear here.

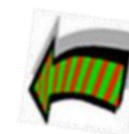
[MeSH](#) [PMC](#) [Bookshelf](#) [Disclaimer](#)

of the U.S. Department of Health and Human Services (HHS). Unauthorized use of
is strictly prohibited.

History and Search Details

 Download
  Delete

Search	Actions	Details	Query	Results	Time
#13	...	>	Search: #6 OR #8 OR #10 Filters: English, Child: 6-12 years	184	11:50:03
#12	...	>	Search: #6 OR #8 OR #10 Filters: English	647	11:48:48
#11	...	>	Search: #6 OR #8 OR #10	692	11:44:54
#10	...	>	Search: #6 AND #9	164	11:41:31
#9	...	>	Search: perform*[Title] OR train*[Title] OR respon*[Title] OR "physical fitness"[Title] OR rehab*[Title] OR physio*[Title]	1,434,642	11:41:09
#8	...	>	Search: #6 AND #7	63	11:40:43
#7	...	>	Search: challeng*[Title] OR barrier*[Title] OR role[Title] OR roles[Title] OR outcome*[Title] OR treatment*[Title] OR intervention*[Title] OR approach*[Title] OR behav*...[Title]	3,171,184	11:40:18
#6	...	>	Search: #5 AND #4	692	11:39:47
#5	...	>	Search: physio*[MeSH Subheading]	13,482,430	11:39:18
#4	...	>	Search: asthma AND exercise[MeSH Major Topic]	983	11:38:41
#3	...	>	Search: #1 AND #2	9,358	11:38:00
#2	...	>	Search: exercise*[Title] OR perform*[Title] OR train*[Title] OR respon*[Title] OR "physical fitness"[Title] OR rehab*[Title] OR physio*[Title]	1,545,139	11:37:42
#1	...	>	Search: "Asthma"[Mesh] Sort by: Most Recent	143,918	11:37:04





Moving more: **physical** activity and its positive effects on long term conditions in children and young people.

Cite Dimitri P, Joshi K, Jones N; Moving Medicine for Children Working Group.

Arch Dis Child. 2020 Nov;105(11):1035-1040. doi: 10.1136/archdischild-2019-318017. Epub 2020 Mar 20.

Share PMID: 32198161 [Review](#).

Importantly, physical activity improves the metabolic profile, bone mineral density, cardiorespiratory fitness and insulin sensitivity while lowering mortality risk in children with T1DM. Children with **asthma** were prevented from doing exercise due to concerns about precipi ...



Exercise and lifestyle changes in pediatric **asthma**.

2 Lu KD, Forno E.

Cite Curr Opin Pulm Med. 2020 Jan;26(1):103-111. doi: 10.1097/MCP.0000000000000636.

Share PMID: 31652153 [Free PMC article](#). [Review](#).

RECENT FINDINGS: Several small studies in children with **asthma** suggest that exercise interventions can improve aerobic fitness, **asthma** symptoms or control and quality of life. ...Larger rigorous studies evaluating lifestyle interventions are needed to better inform ...



The impact of exercise on **asthma**.

3 Lang JE.

Cite Curr Opin Allergy Clin Immunol. 2019 Apr;19(2):118-125. doi: 10.1097/ACI.0000000000000510.

Share PMID: 30601152 [Review](#).

Many patients with **asthma** report exercise as a trigger for their **asthma**, which likely leads to exercise avoidance as a means to control symptoms. ...SUMMARY: In addition to routine management guidelines, clinicians should recommend for their patients with **asthma** ...



Exercise and **Asthma**.

4 Côté A, Turmel J, Boulet LP.

Cite Semin Respir Crit Care Med. 2018 Feb;39(1):19-28. doi: 10.1055/s-0037-1606215. Epub 2018 Feb 10.

Share PMID: 29427982 [Review](#).

However, in addition to its well-known cardiovascular and metabolic benefits, physical training has been shown to be beneficial for asthmatic adults and children in improving **asthma** control and **asthma**-related quality of life. Exercise training also reduces the risk ...



Asthma.

5 Nystad W.

Cite Int J Sports Med. 2000 Nov;21 Suppl 2:S98-102. doi: 10.1055/s-2000-8498.

Share PMID: 11142601

From an epidemiological point of view four issues are briefly emphasized here: the definition of **asthma**, time trends and regional differences, and risk factors for **asthma**. Furthermore, I will focus upon a few aspects regarding the relation between exercise and **as** ...



Moving more: physical activity and its positive effects on long term conditions in children and young people

Paul Dimitri,¹ Kush Joshi,² Natasha Jones,² on behalf of the Moving Medicine for Children Working Group

¹Paediatric Endocrinology, Sheffield Children's NHS Foundation Trust, Sheffield, UK
²Faculty of Sports and Exercise Medicine, Oxford University Hospitals NHS Trust, Oxford, UK

Correspondence to Professor Paul Dimitri, Paediatric Endocrinology, Sheffield Children's NHS Foundation Trust, Sheffield S10 2TN, UK; Paul.Dimitri@sch.nhs.uk

Received 29 October 2019
Revised 2 March 2020
Accepted 3 March 2020
Published Online First 20 March 2020

ABSTRACT

While the benefits of regular participation in physical activity in children and young people are clear, misconceptions have developed about the possible negative effects and potential complications of exercise on long-term conditions such as epilepsy, asthma and diabetes. Over the last decade evidence has emerged supporting the positive impact that physical activity has on long-term conditions. Previous concerns were raised about the risks of hypoglycaemia in children with type 1 diabetes mellitus (T1DM) thus limiting participation in sports. Importantly, physical activity improves the metabolic profile, bone mineral density, cardiorespiratory fitness and insulin sensitivity while lowering mortality risk in children with T1DM. Children with asthma were prevented from doing exercise due to concerns about precipitating an acute asthmatic episode. To the contrary, physical activity interventions have consistently shown an increase in cardiovascular fitness, physical capacity, asthma-free days and quality of life in childhood asthmatics. Children with epilepsy are often excluded from sports due to concerns relating to increased seizure frequency, yet evidence suggests that this is not the case. The evidence supporting physical activity in childhood survivors of cancer is growing but still primarily confined to patients with acute lymphoblastic leukaemia. Participation in sports and physical activity also reduces mental health problems developing in adolescence. While further research is required to investigate benefits of physical activity on specific aspects of long-term conditions in children, in general this group should be advised to increase participation in sports and exercise as a means of improving long-term physical and mental health.

What is already known on this topic?

- ▶ A lot of misconceptions about the risks of participating in physical activity and sports have developed for children with long-term conditions with no supporting evidence.
- ▶ Lack of physical activity leads to one in six deaths in the UK and our population is 20% less active than 50 years ago.

What this study adds?

- ▶ Physical activity advice should form part of the consultation for children and young people with long-term conditions and should be encouraged to improve outcomes.
- ▶ Information supporting the benefits of physical activity for children and young people with long-term conditions should be readily available to those delivering and participating in physical activity.
- ▶ Policy makers should ensure that children with long-term conditions are supported to participate in physical activity and not prevented from exercising due to fear of misconception. Investment into the promotion and prescribing of physical activity for children with long-term conditions is required.

of physical activity for children and young people are poorly understood, and importantly misconceptions have evolved over time about potential risks of partaking in sports and exercise for certain conditions such as epilepsy and diabetes. A signifi-

- ▶ Adolescent
- ▶ Asthma / physiopathology
- ▶ Asthma / therapy
- ▶ Child
- ▶ Chronic Disease / therapy*
- ▶ Diabetes Mellitus, Type 1 / physiopathology
- ▶ Diabetes Mellitus, Type 1 / therapy
- ▶ Epilepsy / physiopathology
- ▶ Epilepsy / therapy
- ▶ Exercise / physiology*
- ▶ Exercise / psychology
- ▶ Exercise Therapy
- ▶ Humans
- ▶ Mental Health
- ▶ Neoplasms / physiopathology
- ▶ Neoplasms / therapy

INTRODUCTION

It has long been known that physical activity and sport have a positive impact on the physical and mental health of children and young people. In an era where childhood obesity is at an all-time high, sustained and regular physical activity leads to improvements in lean mass and a reduction in fat mass, and improved long-term health. Physical inactivity is responsible for 6% of deaths and is estimated to cost the UK £7.7 billion annually, and yet our population is around 20% less active than 50 years ago.¹ Access to appropriate healthcare and support for children with long-term conditions will ensure that they are able to manage their condition well, reducing ill health and further deterioration or secondary co-morbidities. For many caregivers and clinicians, the benefits

Dimitri, P., Joshi, K., & Jones, N. (2020). Moving more: Physical activity and its positive effects on long term conditions in children and young people. *Archives of Disease in Childhood*, 105(11), 1035–1040. <https://doi.org/10.1136/archdischild-2019-318017>



© Author(s) (or their employer(s)) 2020. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Dimitri P, Joshi K, Jones N, et al. Arch Dis Child 2020;105:1035–1040.



Reflect on your research question?

Search alternate databases to see article keywords / subjects e.g. Google, Advanced Google, Google Scholar...

What is your PICO: Population / Intervention / Comparison / Outcome?

Develop a search strategy based on your research question.

Search MEDLINE using MeSH terms reviewing definitions, dates, and alternate subjects.

Consult the MeSH headings database @ <https://www.ncbi.nlm.nih.gov/mesh>

Consider exploding and/or focusing on subject headings

Search using natural language keywords, phrases and acronyms.

Consult plain thesauri including WordHippo to find alternate keywords and/or phrases @ <https://www.wordhippo.com/>

Create a list of filters including age of participants, language, document type, date...

Map out a search strategy that may include MeSH terms, and/or natural language, and filters.

OR search concepts

AND search statements

Combine search results

Try MEDLINE via Web of Science Complete first, then move to MEDLINE via PubMed

Search, evaluate results, change search strategies...

Identify papers that include original data from scholarly peer-reviewed journals

Mark citations of interest for downloading, export citations to Zotero... retain your search strategies and notes

Follow up to identify key papers for downloading.

Do your citations help to answer your research question?

Ask for help if needed.



Reflect on your research question?

Search alternate databases to see article keywords / subjects e.g. Google, Advanced Google, Google Scholar...

What is your PICO: Population / Intervention / Comparison / Outcome?

Develop a search strategy based on your research question.

Search MEDLINE using MeSH terms reviewing definitions, dates, and alternate subjects.

Consult the MeSH headings database @ <https://www.ncbi.nlm.nih.gov/mesh>

Consider exploding and/or focusing on subject headings

Search using natural language keywords, phrases and acronyms.

Consult plain thesauri including WordHippo to find alternate keywords and/or phrases @ <https://www.wordhippo.com/>

Create a list of filters including age of participants, language, document type, date...

Map out a search strategy that may include MeSH terms, and/or natural language, and filters.

OR search concepts

AND search statements

Combine search results

Try MEDLINE via Web of Science Complete first, then move to MEDLINE via PubMed

Search, evaluate results, change search strategies...

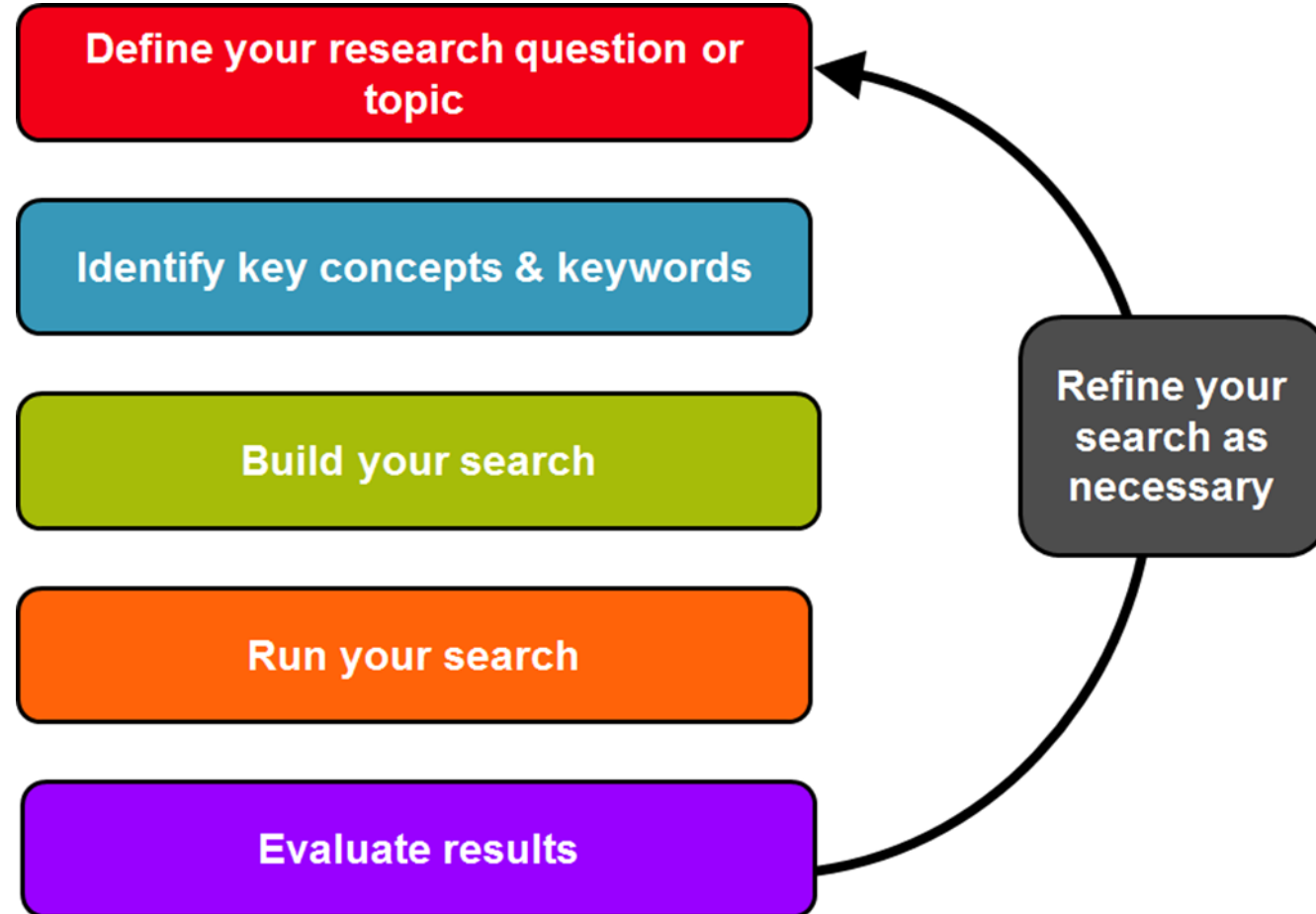
Identify papers that include original data from scholarly peer-reviewed journals

Mark citations of interest for downloading, export citations to Zotero, Zotero... retain your search and notes

Follow up to identify key papers for downloading.

Do your citations help to answer your research question?

Ask for help if needed.



Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- [How to recognize empirical research papers!](#)
- Citation Management
- Where, how and when to get help

How to Recognize an Original Research Article (2020, Collier Library, PowToon, YouTube, 3:27)
<https://www.youtube.com/watch?v=VzxFgkR9L7s>

How to recognize an original research article

If your professor asks you to locate a research article or study you should look for an article that is based on research that the author(s) of the article conducted and then wrote about. Research in this case means something based on observation and that collects data in a methodical way.

Primary Research in PubMed (2021, Emily Metcalf, Texas A&M University-Corpus Christi Library, YouTube, 4:15)
<https://www.youtube.com/watch?v=lpULesBEUMY>

Primary Research in PubMed



Secular trends in aerobic fitness performance in 13–18-year-old adolescents from 1976 to 2001

P R T Huotari,¹ H Nupponen,² L Laakso,¹ U M Kujala³

¹Department of Sport Sciences, University of Jyväskylä, Jyväskylä, Finland
²Department of Teacher Education in Rauma, University of Turku, Turku, Finland
³Department of Health Sciences, University of Jyväskylä, Jyväskylä, Finland

Correspondence to:
 P R T Huotari, Department in Sport Sciences, University of Jyväskylä, P.O. Box 35, 40014 University of Jyväskylä, Finland;
 pettti.huotari@jyu.fi

Accepted 29 January 2009
 Published Online First
 11 February 2009

ABSTRACT

Objective To analyse the secular trends in aerobic fitness performance and some of its determinants (body mass index (BMI) and leisure time physical activity (LTPA)) in adolescents.

Design Cross-sectional population-based studies in 1976 and 2001 in Finland. A stratified random sample of Finnish 13–18-year-old adolescents was studied in 1976 (n = 717; 384 boys and 333 girls) and in 2001 (n = 558; 305 boys and 253 girls). The main outcome measure was aerobic fitness, estimated with a 2000 m (for boys) and 1500 m (for girls) running test; the weight and height of participants were also measured. Self-reported weekly frequency of LTPA of at least 30 min duration and regularity of participation in organised sport were obtained by questionnaire. Identical methods were used in 1976 and 2001.

Results Running time was longer in 2001 compared to 1976 in boys (56 s, Cohen d = 0.46, medium effect size; p < 0.001) and girls (29 s, d = 0.32, small; p < 0.01). BMI and participation in LTPA explained more of the variance in aerobic fitness in 2001 than in 1976 in boys and girls.

Conclusions Aerobic fitness of school-aged children deteriorated between the measurement points. BMI and organised LTPA were better associated with aerobic fitness in 2001 than in 1976. An increase in overweight and obesity was associated with the decrease in aerobic fitness. Although the importance of organised LTPA to fitness increased, it is possible that the decrease in overall physical activity between 1976 and 2001 contributed most to the decrease in the level of aerobic fitness.

Low aerobic fitness has been shown to be a strong risk factor for cardiovascular diseases, type 2 diabetes and mortality in adults.^{1–4} Good endurance running capacity in particular seems to predict low risk for metabolic syndrome and mortality.^{5–8}

There is evidence that the level of aerobic fitness has declined among adolescents, although long-term follow-ups are rare.^{6–12} Aerobic fitness has declined among Finnish military service conscripts during recent decades,¹³ but information on long-term changes in aerobic fitness and its determinants among school aged adolescents is lacking.

Overweight and obesity among children and adolescents has increased during the last few decades worldwide.^{6,7,14} It has also been shown that overweight has an inverse association with aerobic fitness and that poor fitness is already related to impaired health in adolescence.^{15–17} Although overweight is increasing, some studies have reported an increase in participation in leisure time physical activity (LTPA).^{18–22} However, it seems that many adolescents do not participate

enough in LTPA and their overall lifestyles may have become more sedentary.

In Finland, in the 1970s the total TV viewing time for adolescents was on average 1.30 h/day while in the past decade screen time has been estimated to be as high as 5–6 h/day.²³ Furthermore, the number of cars per capita increased from 0.2 to 0.4 between 1976 and 2001, and over 60% of Finnish homes had a computer and almost all Finns aged 15–39 used a mobile telephone in 2000.²⁴ Technological change over the past 25 years has been rapid, and this is probably the main reason for the more sedentary lifestyle found among adolescents^{25–28} that, in turn, may have an effect on physical fitness.

The main aims of this study were to analyse secular trends in aerobic fitness performance (later used only aerobic fitness) and study changes in some of the determinants (body mass index (BMI), LTPA, sports club participation) of aerobic fitness in 13–18-year-old adolescents at two measurement points, 1976 and 2001.

METHODS

Participants

In 1976 and in 2001, specially trained teams carried out measurements of fitness among 9–21-year-old adolescents and young adults in Finnish schools. The target group consisted of 13–18-year-old boys and girls who were invited to take part in a long-distance running test in 1976 and in 2001. Of these, 717 adolescents (384 boys and 333 girls) took part in the study in 1976 and 558 pupils (305 boys and 253 girls) in 2001 (table 1). As the anthropometric measurements and questionnaire study were not implemented for all the participants, complete information (ie, the long distance running test, weight, height and the questionnaire data) was only available for a total of 913 participants. Of these, 377 adolescents (211 boys and 166 girls) participated in 1976 and 536 (292 boys and 244 girls) in 2001. Before the running test participants were allowed to refuse to participate in the tests; however, only participants with an illness or injury refused (non-participation due to diseases or injuries <5%). This study was approved by the ethics committee of the Central Finland Health Region.

In 1976 data were collected from 56 and in 2001 from 17 comprehensive and high schools. The 1976 sample was a four-phased stratified random sample drawn from schools representing different provinces and types of municipalities (urban and rural). In the first phase a total of 20 towns and communes from 4 geographical areas (west, east, middle and north) of Finland were randomly

Huotari, P. R. T., Nupponen, H., Laakso, L., & Kujala, U. M. (2010). Secular trends in aerobic fitness performance in 13-18-year-old adolescents from 1976 to 2001. *British Journal of Sports Medicine*, 44(13), 968-972. <https://doi.org/10.1136/bjsm.2008.055913>

Publication types

► Research Support, Non-U.S. Gov't

MeSH terms

- Adolescent
- Body Mass Index
- Exercise / physiology*
- Female
- Humans
- Leisure Activities
- Male
- Oxygen Consumption / physiology
- Physical Fitness / physiology*
- Running / physiology
- Sex Characteristics
- Time Factors

Table 1 Characteristics of participants in 1976 and 2001

Characteristics	Boys, 1976 (n = 384)	Boys, 2001 (n = 305)	Girls, 1976 (n = 333)	Girls, 2001 (n = 253)
Age, years	15.9 (1.4)	15.4 (1.3)	15.7 (1.4)	15.3 (1.3)
Height, cm	170.0 (10.2)	170.8 (9.1)	163.2 (5.9)	162.0 (5.9)
Weight, kg	58.3 (11.7)	60.8 (12.3)	53.0 (7.5)	54.8 (9.8)
Body mass index	19.9 (2.5)	20.7 (3.2)	19.9 (2.4)	20.7 (3.3)
Leisure time physical activity, % (n):				
Less than twice a week	30.3 (116)	13.0 (39)	31.9 (106)	15.2 (38)
2-6 times a week	44.1 (169)	54.0 (162)	44.0 (146)	50.8 (127)
Every day	25.6 (98)	33.0 (99)	24.1 (80)	34.0 (85)
Sports club participation, % (n):				
No participation	68.0 (255)	52.2 (154)	82.8 (270)	69.8 (173)
Sometimes	12.3 (46)	4.7 (14)	6.7 (22)	4.0 (10)
Regular	19.7 (74)	43.1 (127)	10.4 (34)	26.2 (65)

Values are mean (SD) unless otherwise stated.

selected by drawing lots. The random sample of 56 schools, matched for size, was taken from these towns and communes. School classes were selected on the basis of the classes that had a physical education lesson on the assessment day. In 2001 the sample was a three-phased stratified random sample. In the first phase, 9 communes were selected randomly from the 20 communes that participated in 1976; 3 of these were rural communes (<10 000 residents). In the second phase 17 schools were selected from the schools that participated in 1976. In the third phase the school classes were selected as in 1976.

Assessment of aerobic fitness

In spring 1976 and spring 2001, specially trained teams carried out measurements of aerobic fitness in the selected schools using identical methodology.²⁶ Aerobic fitness was estimated with a 2000 m running test for boys and a 1500 m running test for girls. The tests conformed to the international standards for assessments and have been described in detail previously.²⁷ The tests have good reliability and validity, and in previous studies the intratester reliability of long distance running has varied between 0.65 and 0.94²⁸ and validity coefficients between 0.65 and 0.88.²⁹

Assessment of BMI and physical activity

The weight and height of the participants were measured by school health nurses or the measuring teams with the calibrated stadiometer and gauge used in school healthcare in Finland. Height and weight were measured to the nearest 1 cm and 0.5 kg and BMI (kg/m^2) was calculated. BMI was used as a continuous variable in most of the statistical analyses. In addition, participants were classified into three groups according to the international BMI cut-off recommendation to compare aerobic fitness between normal weight and overweight or obese pupils.³⁰

Physical activity and participation in sports were recorded using a self-report questionnaire that was administered individually in connection with the fitness test. The questionnaire was identical at both measurement points. The questionnaire contained items on frequency per week of physical activity outside school hours (not at all, less than once a month, once a month, 2-3 times a month, at most once a week, 2-6 times a week, every day of at least 30 min duration) and participation in sports club training (not at all, sometimes, regularly).

In the analytical phase the responses were coded from 1 to 3. The LTPA categories were 1 = less than twice a week, 2 = 2-6 times a week and 3 = every day. In previous studies internal consistency coefficients of these items as indicators of reliability have varied from 0.44 to 0.76. The sports club participation variable showed higher interage stability than other variables concerning physical activity.³¹

Statistical analyses

The running test results are expressed as mean (SD). In addition, an index of aerobic fitness was calculated by transferring the running test results to age-standardised z points separately for boys and girls. The standardised z points were used in the statistical analyses. Mann-Whitney U test, 95% confidence intervals (95% CI) and analysis of covariance (ANCOVA; adjusted to age, BMI and LTPA) were used to compare differences in aerobic fitness between the measurement points in boys and girls. The meaningfulness of differences was examined by calculating the effect size Cohen d using means and standard deviations.³² The association between age, LTPA, BMI and aerobic fitness was examined by linear regression at both measurement points. ANCOVA was applied in testing the differences in aerobic fitness between the physical activity and BMI categories. In addition, ANCOVA was used in comparing aerobic fitness adjusted to BMI in inactive and overweight adolescents between 1976 and 2001. Because of the different aerobic fitness tests used, boys and girls were always analysed separately. All the statistical tests were performed by SPSS statistical software, V.15.0 (SPSS, Chicago, Illinois, USA).

RESULTS

Secular trend in aerobic fitness from 1976 to 2001

The mean 2000 m running test time for boys in 1976 was 559 s (95% confidence interval (CI), 543 to 570 s) and in 2001 615 s (95% CI, 600 to 630 s). The mean 1500 m running test time for girls in 1976 was 494 s (95% CI, 486 to 503 s) and in 2001 523 s (95% CI, 510 to 535 s). The mean difference between 1976 and 2001 among boys was 56 s (increase 10%, $p < 0.001$, Cohen $d = 0.46$, medium effect size) and among girls 29 s (increase 6%; $p < 0.01$, $d = 0.32$, small effect size) (fig 1). The secular trend in distributions of running time is shown in figure 2.

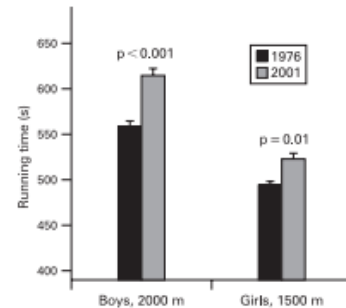


Figure 1 Running time in boys and girls in 1976 and 2001. Age-adjusted p values for difference between 1976 and 2001 are shown.

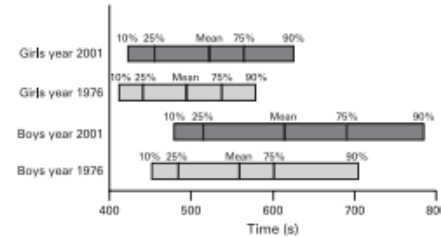


Figure 2 Distributions of running time in boys and girls in 1976 and 2001.

Secular trend in determinants of aerobic fitness from 1976 to 2001

Between 1976 and 2001 the average body weight of the boys increased by 4% ($p = 0.019$) while average body height increased by only 0.5%. In girls average body weight increased by 3% ($p = 0.049$) but average body height remained the same (table 1). BMI increased by 4% in girls ($p = 0.003$) and in boys ($p = 0.002$) over the 25-year period. The proportion of boys who participated in LTPA < twice a week was 30.3% in 1976 and 15.0% in 2001 (table 1). The percentages for girls were 31.9% in 1976 and 15.2% in 2001. Of the boys, 19.7% participated in sports club training in 1976 and 43.1% in 2001. In girls the percentages of regular sports club participation were 10.4% and 26.2%.

Table 2 shows the results of the age-adjusted linear regression analysis for the individual determinants of aerobic fitness and the results of the linear regression analysis in which age, BMI, LTPA and sports club participation were included in the model as explanatory variables. Among boys the cumulative R^2 of this model was 0.08 in 1976 and 0.23 in 2001. For girls the R^2 of the model was 0.08 in 1976 and 0.34 in 2001.

Figure 3 shows that aerobic fitness was lower in 2001 than in 1976 in all the LTPA groups among boys. The standardised difference (d) varied from 0.37 to 0.60 (small/medium) over the time. Among girls, differences were found between the two lowest LTPA groups, with a large effect size ($d = 0.73$) reported for differences between the lowest LTPA groups; however, those reporting daily physical activity had similar fitness levels in 1976 and 2001. According to the BMI international cut-offs 14 (6%) of the boys were overweight or obese in 1976 and 37 (12%) in 2001. Among the girls 7 (4%) were overweight or obese in 1976 and 30 (12%) in 2001. Obese or overweight participants had lower aerobic fitness in 1976 and 2001 among boys (in 1976 $p = 0.004$ and in 2001 $p < 0.001$) and among girls in 2001 ($p < 0.001$). After adjustment for age and BMI, no statistically significant difference emerged in the aerobic fitness of obese/overweight boys between 1976 and 2001 while overweight/obese girls showed lower aerobic fitness in 2001 than in 1976 ($p = 0.056$).

DISCUSSION

The main findings of this study showed that, compared with the 1976 sample, boys and girls in 2001 had lower aerobic fitness and higher BMI. Secondly, BMI and LTPA, in particular participation in organised sports, explained the higher percentage of aerobic fitness in 2001 than in 1976.

In this study aerobic fitness was expressed as the absolute time taken in a long-distance running test (s) and the

Table 2 Determinants of aerobic fitness index for boys and girls in 1976 and 2001

Determinant	Values for individual determinants*		Cumulative model†	
	β (95% CI)	R^2	R^2	p Value
Year 1976 boys (n = 211):				
Age	-0.11 (-0.17 to 0.02)	0.008	0.008	0.10
BMI	-0.13 (-0.12 to 0.01)	0.018	0.018	0.081
LTPA	0.26 (0.16 to 0.53)	0.064	0.070	<0.001
Sports club participation	0.20 (0.08 to 0.42)	0.042	0.082	0.059
Year 2001 boys (n = 292):				
Age	0.10 (-0.01 to 0.18)	0.007	0.007	0.078
BMI	-0.36 (-0.15 to -0.08)	0.127	0.127	<0.001
LTPA	0.23 (0.19 to 0.55)	0.058	0.179	<0.001
Sports club participation	0.30 (0.20 to 0.44)	0.096	0.230	<0.001
Year 1976 girls (n = 166):				
Age	0.08 (-0.05 to 0.16)	0.000	0.000	0.33
BMI	-0.10 (-0.10 to 0.03)	0.002	0.002	0.23
LTPA	0.26 (0.14 to 0.52)	0.062	0.077	<0.001
Sports club participation	0.16 (0.01 to 0.42)	0.020	0.082	0.18
Year 2001 girls (n = 244):				
Age	-0.06 (-0.15 to 0.06)	0.000	0.000	0.39
BMI	-0.42 (-0.18 to -0.10)	0.165	0.165	<0.001
LTPA	0.30 (0.29 to 0.67)	0.087	0.210	<0.001
Sports club participation	0.42 (0.37 to 0.65)	0.168	0.335	<0.001

*By linear regression analysis, values for other determinants than age are from models in which age has been entered first; †by linear regression analysis, R^2 and p values are from a fixed cumulative model.
BMI, body mass index; LTPA, leisure time physical activity.

corresponding standardised z value. Mean running time increased among boys by 56 s (10%) and among girls by 29 s (6%) from 1976 to 2001. The difference in the mean distance-running speed among boys was 0.33 m/s and 0.17 m/s among girls. This indicates that on average, a boy in 2001 would finish about 180 m behind the average 1976 boy over the 2000 m distance. In girls the corresponding difference in the 1500 m run was 83 m. In addition, as there was a difference in average age between the two samples of 6 months in boys and 4.8 months in girls, we used age, BMI and LTPA as covariates for the examination of secular trends in aerobic fitness. After this adjustment, a significant secular decline was found among boys ($p = 0.011$) and girls ($p = 0.017$). The decline in aerobic fitness is in accordance with the findings of a number of shorter-term studies from other countries on secular trends in aerobic fitness.³³⁻³⁵ Tomkinson and colleagues investigated 20-m shuttle run performance in children aged 6-19 years from 11 developed countries during the period 1981-2000 and found a decrease in aerobic performance of 0.43% per year.³³ In our study the time taken to run increased on average from 1976 to 2001 by 0.40% per year in boys and 0.24% in girls. However, it is difficult to know the exact time-related patterns of change. The change over the last 10 years could have been more rapid than in the first 10 years.³³ Furthermore, distributions showed decline for all percentile levels with the largest change in difference found for the poorest aerobic fitness level in boys and girls. Despite our results, a worldwide analysis of 109 studies from 37 countries showed that in the aerobic performance of children and adolescents the best performing children were from the Northern European countries, including Finland.³⁶

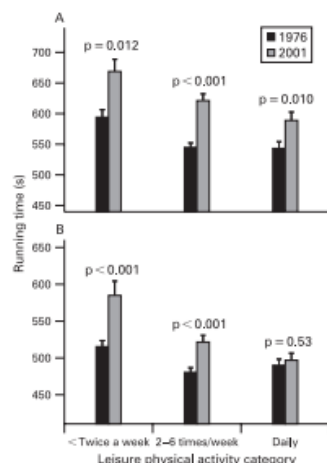


Figure 3 Running time by physical activity category in 1976 and 2001 in boys (A) and girls (B). Age-adjusted p values for difference between 1976 and 2001 are shown.

The secular trend in BMI increased by 4% in boys and girls from 1976 to 2001 in our study samples. It is well known that low levels of physical fitness and obesity are associated with a higher prevalence of cardiovascular disease (CVD) risk factors, type 2 diabetes and higher CVD mortality,³⁴ and that overweight and obesity among children and adolescents have increased during the last few decades worldwide.³⁴ Overweight is a disadvantage in locomotion and an association between obesity and low aerobic fitness is likely to be seen most clearly in activities involving the carrying of body weight, such as running.^{35–38}

In the regression analysis BMI in 2001 explained more of the variation in running performance than was explained by BMI in 1976. In 1976 BMI did not explain any of the boys' aerobic fitness whereas in 2001 BMI explained 12% of the variance of aerobic fitness. In girls the share of the variation explained by BMI had increased from 0.2% to 17%. The international BMI cut-offs were used to compare aerobic fitness between normal weight, overweight and obese pupils.³⁹ The results indicated that the difference in aerobic fitness between overweight/obese and normal weight adolescents was significant in boys and girls. Furthermore, overweight and obese girls had poorer aerobic fitness in 2001 than in 1976, even after adjustment for BMI. In agreement with our study a similar trend in decreased running performance and increased BMI was found in 10–11-year-old children, who required more time to perform a 1.6 km run/walk test in 1997 than in 1985.⁴⁰ There is also evidence of a similar association between overweight and low aerobic fitness in the 20 m shuttle run test.⁴¹ Common factors associated with the increase in body mass in today's society include the increased availability of energy-rich foods and sedentary behaviour (eg, increased screen time), along with decreased daily physical activity among adolescents.^{34–36}

This study has some limitations. Aerobic fitness was measured by a long-distance running test. This method may result in errors at the individual level, although it works rather well at the group level, for example in schools. However, in physical education in Finland physical fitness is measured over a long period, including the test of aerobic fitness by long-distance running, and previous research suggests that the running tests have acceptable validity and reliability.^{39,42} However, a better alternative for investigating aerobic fitness would have been a

What is already known on this topic

There is some evidence that children's aerobic fitness levels are declining in many countries while, at the same time, the proportion of children classified as overweight or obese continues to increase.

What this study adds

Our long-term study shows a decline in endurance running ability among adolescents between 1976 and 2001. Increased body weight and differences in LTPA, in particular participation in organised sports, are playing an increasing role as determinants of aerobic fitness, whereas participation in other types of physical activity has decreased.

Previous studies suggest that physical activity may prevent obesity, and overall physical activity has been found to correlate negatively with the amount of body fat and positively with aerobic fitness.^{39,43} However, in general the evidence for the health-promoting effects of physical activity among children and adolescents is not strong.^{39–43} It is also noteworthy that moderate to vigorous physical activity decreased significantly between ages 9–15 years. According to recent longitudinal data 31% of US 15-year-old adolescents were sufficiently physically active (60 min per day) on weekdays and only 17% on weekends.⁴⁴

Our study indicated that participation in LTPA had a positive association with aerobic fitness in 1976 and 2001. In fact, in 1976 it explained the variance of aerobic fitness best, even if the percentage explained by the whole model was rather low. After adjusting for age, sports club participation in addition to BMI explained the variance of girls' aerobic fitness in 2001. In agreement with our study the secular trend in frequency of LTPA among adolescents in Finland increased during the 30 years from 1977 to 2007 in both sexes, particularly in organised sport.²⁴ This means that intensive LTPA more often than previously means participation in organised sport.²⁴ Although frequency of participation in LTPA increased during the 30 years studied, overall physical activity has perhaps declined during this time. Traditionally, the share of spontaneous physical activity engaged in by adolescents has been larger in Finland than in other countries.²⁴ Notably, aerobic fitness has also decreased among the group of boys who participate daily in LTPA. This may perhaps be explained by the difference in the type of sports as a higher proportion of physically active children participated in endurance type sports in 1976 than in 2001. Despite this, a major reason for the decline in physical fitness, in addition to the increase in obesity, may be the decrease in daily physical activity/increasingly sedentary lifestyle that has accompanied societal changes during the 25-year study period.^{39–42}

This study has some limitations. Aerobic fitness was measured by a long-distance running test. This method may result in errors at the individual level, although it works rather well at the group level, for example in schools. However, in physical education in Finland physical fitness is measured over a long period, including the test of aerobic fitness by long-distance running, and previous research suggests that the running tests have acceptable validity and reliability.^{39,42} However, a better alternative for investigating aerobic fitness would have been a

Original article

maximal oxygen uptake test in a laboratory with calibrated equipment.

Conclusions

In 13–18-year-old adolescents aerobic fitness declined during the 25 years from 1976 to 2001. Furthermore, we found a change in the explanatory power of the determinants of aerobic fitness: in 2001 BMI and LTPA explained a higher proportion of aerobic fitness than the same variables did in 1976. Adolescents who do not participate in LTPA and have high BMI are likely to show poorer aerobic fitness. Participation in organised sport, however, increased and it has continuing importance for Finnish adolescents' aerobic fitness.

Funding Funding was received from the Finnish Ministry of Education and Academy of Finland. The funding sources had no role in any aspects of the study or this paper.

Competing interests None declared.

Ethics approval Ethics approval was obtained from the ethics committee of the Central Finland Health Region.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- Lakka TA, Venäläinen JM, Rauramaa R, et al. Relation of leisure-time physical activity and cardiorespiratory fitness to the risk of acute myocardial infarction in men. *New Engl J Med* 1994;**330**:1549–54.
- Blair SN, Kampert JB, Kohl HW III, et al. Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. *JAMA* 1996;**276**:205–10.
- Kujala UM, Mäntä P, Kaprio J, et al. Occurrence of chronic disease in former top-level athletes: Predominance of benefits, risks or selection effects? *Sports Med* 2003;**33**:553–61.
- Myers J, Franks M, Froelicher V, et al. Exercise capacity and mortality among men referred for exercise testing. *New Engl J Med* 2002;**346**:793–801.
- Wisloff U, Njølstad SM, Ellingsen D. Cardiovascular risk factors emerge after artificial selection for low aerobic capacity. *Science* 2005;**307**:418–20.
- Wedderkopp N, Frøberg K, Hansen HS, et al. Secular trends in physical fitness and obesity in Danish 8-year-old girls and boys: Odense School Child Study and Danish substudy of the European Youth Heart Study. *Scand J Med Sci Sports* 2004;**14**:150–5.
- Dyrstad SM, Aarstad A, Hollien J. Aerobic fitness in young Norwegian men: a comparison between 1980 and 2002. *Scand J Med Sci Sports* 2005;**15**:298–303.
- Tomkinson GR, Léger LA, Olds TS, et al. Secular trends in the performance of children and adolescents 1980–2000 – an analysis of 55 studies of the 20 m shuttle run test in 11 countries. *Sports Med* 2003;**33**:295–300.
- Møller NC, Wedderkopp N, Kristensen PL, et al. Secular trends in cardiorespiratory fitness and body mass index in Danish children: The European Youth Heart Study. *Scand J Med Sci Sports* 2007;**17**:331–5.
- Alban HM, Hamlin MJ, Ross JJ. Secular trends and distributional changes in health and fitness performance variables of 10–14 year old New Zealand children between 1981 and 2003. *Br J Sports Med*. Published Online First: 16 May 2008. doi: 10.1136/bjsm.2008.047142.
- Malina R. Physical fitness of children and adolescents in the United States: status and secular change. In: Tomkinson GR, Olds TS, eds. *Pediatric fitness secular trends and geographic variability*. Basel, Switzerland: Karger, 2007: 67–80.
- Matton L, Duvigneaud N, Wijnaldede K, et al. Secular trends in anthropometric characteristics, physical fitness, physical activity and biological maturation in Flemish adolescents between 1969 and 2005. *Am J Hum Biol* 2007;**19**:345–57.
- Santtilä M, Kyröläinen H, Vasankari TJ, et al. Physical fitness profiles in young Finnish men during the years 1975–2004. *Med Sci Sports Exerc* 2006;**38**:1990–4.
- World Health Organization. *Preventing and managing the global epidemic*. Geneva, Switzerland: World Health Organization, 2000.
- Malina RM. Physical activity and fitness of children and youth. *Med Exerc Nutr Health* 1995;**4**:123–35.
- Eisenmann JC, Wiek GJ, Imels MA, et al. Fitness, fatness and cardiovascular disease risk factors in children and adolescents. *Med Sci Sports Exerc* 2007;**39**:1251–6.
- Fogelholm M, Stigman S, Huusman T, et al. Physical fitness in adolescents with normal weight and overweight. *Scand J Med Sci Sports* 2008;**18**:162–70.
- Westerstål M, Barnekow-Bergqvist M, Hedberg G, et al. Secular trends in sports participation and attitudes among adolescents in Sweden from 1974 to 1995. *Acta Paediatr* 2003;**92**:692–9.
- Dallman J, Norton K, Norton L. Evidence for secular trends in children's physical activity behaviour. *Br J Sports Med* 2005;**39**:992–7.
- Nelson MC, Neumark-Sztainer D, Hannan PJ, et al. Longitudinal and secular trends in physical activity and sedentary behaviour during adolescence. *Pediatrics* 2006;**118**:1627–34.
- Laakso L, Telama R, Noponen H, et al. Trends in leisure time physical activity among young people in Finland, 1977 and 2007. *Eur Phys Educ Rev* 2008;**14**:139–55.
- Nader PR, Bradley RH, Houts RM, et al. Moderate-to-vigorous physical activity from ages 9 to 15 years. *JAMA* 2008;**300**:299–305.
- Statistics Finland. Finland as numbers, 2007. <http://www.stat.fi/hup/uom90/lokaluu.html> (accessed 10 September 2008).
- Niemelä I, Kiskilä S, Likkonen M. *Time use in Finland*. Helsinki, Finland: Statistics Finland, 1979.
- Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc* 2000;**32**:963–75.
- Noponen H. *The physical-motor fitness of school children: reports of physical culture and health*. Jyväskylä, Finland: Research Institute of Physical Culture and Health, 1981.
- Larson LA, ed. *Fitness, health and work capacity. International standards for assessment*. New York, USA: Macmillan, 1974.
- Simons J, Baunen G, Renssen R, et al. Construction of a motor ability test battery for boys and girls aged 12 to 19 years, using factor analysis. In: Simons J, Renssen R, eds. *Evaluation of motor fitness*. Leuven, Belgium: Institute of Physical Education of the KU, 1982: 151–67.
- Safrit MJ. The validity and reliability of fitness tests for children: a review. *Ped Exerc Sci* 1990;**2**:9–28.
- Cole TJ, Bellizzi MC, Flegal KM, et al. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ* 2000;**320**:1–6.
- Telama R, Yang X, Viikari J, et al. Physical activity from childhood to adulthood. *Am J Prev Med* 2005;**28**:267–73.
- Cohen J. *Statistical power analysis for the behavioural sciences*, 2nd edn. Hillsdale, New Jersey, USA: Erlbaum, 1988.
- Olds T, Tomkinson G, Léger L, et al. Worldwide variation in the performance of children and adolescents: an analysis of 109 studies of the 20-m shuttle run test in 37 countries. *J Sport Sci* 2006;**24**:1025–38.
- Freedman DS, Dietz WH, Srinivasan SR, et al. The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa heart study. *Pediatrics* 1999;**103**:1175–82.
- Dallman J, Olds T, Norton K, et al. The evolution of fitness and fatness in 10–11-year-old Australian schoolchildren: changes in distributional characteristics between 1985 and 1997. *Ped Exerc Sci* 1999;**11**:108–21.
- Kaurialainen S, Rimpelä A, Väänä A, et al. Secular trends in overweight and obesity among Finnish adolescents in 1977–1999. *Int J Obes* 2002;**26**:544–52.
- Ara I, Vicente-Rodriguez G, Jimenez-Ramirez J, et al. Regular participation in sports is associated with enhanced physical fitness and lower fat mass in prepubertal boys. *Int J Obes* 2004;**28**:1585–93.
- Walker K, Kaprio J, Kujala UM. Associations between long-term physical activity, waist circumference and weight gain: a 30-year longitudinal twin study. *Int J Obes* 2008;**32**:353–361.
- Katzmarzyk PT, Malina RM, Song TM, et al. Physical activity and health-related fitness in youth: a multivariate analysis. *Med Sci Sports Exerc* 1998;**30**:709–14.
- Rowlands AV, Ingledew DK, Eston RG. The effect of type of physical activity measure on the relationship between body fatness and habitual physical activity in children: a meta-analysis. *Ann Hum Biol* 2000;**27**:479–97.
- Telama R, Nauli R, Noponen H, et al. Physical fitness, sporting lifestyles and Olympic ideals: cross-cultural studies and youth sport in Europe. *ACSPF sport science studies* 17. Schorndorf, Germany: Verlag Karl Hofmann, 2002.
- Telama R, Noponen H, Piironen M. Physical activity among young people in the context of lifestyle. *Eur Phys Educ Rev* 2005;**11**:115–37.

Effect of 8 Weeks of Incremental Aerobic Training on Inflammatory Mediators, Cardiorespiratory Indices, and Functional Capacity in Obese Children With Bronchial Asthma

Ragab K. Elnaggar

Prince Sattam bin Abdulaziz University and Cairo University

Mohammed A. Shendy

Cairo University and Taibah University

Mahmoud S. Elfakharany

Cairo University

Purpose: To appraise the effects of incremental aerobic training (IAT) on systemic inflammatory mediators, cardiorespiratory indices, and functional capacity in obese children with bronchial asthma. **Methods:** This study included 30 children with asthma (age = 8–16 y) allocated randomly into either the control group (n = 15; received the traditional pulmonary rehabilitation program) or IAT group (n = 15; engaged in 8 weeks of IAT in addition to the traditional pulmonary rehabilitation program). The systemic inflammatory mediators (high-sensitivity C-reactive protein and interleukin-6), cardiorespiratory indices (peak oxygen uptake, minute ventilation, maximum heart rate, heart rate recovery at 1 min after exercises, and oxygen pulse), and functional capacity (represented by 6-min walk test) were analyzed pretreatment and posttreatment. **Results:** A significant reduction in the level of high-sensitivity C-reactive protein and interleukin-6 and increase in peak oxygen uptake, minute ventilation, maximum heart rate, and heart rate recovery at 1 minute after exercises was observed among the IAT group as compared with the control group. In addition, the IAT group covered a longer distance in the 6-minute walk test than the control group, suggesting favorable functional capacity. **Conclusion:** The study results imply that IAT has the potential to improve the inflammatory profile, cardiorespiratory fitness, and functional capacity of obese children with bronchial asthma.

Keywords: conditioning exercises, pulmonary rehabilitation, physical fitness, maximum oxygen consumption, obesity

Asthma is the most significant chronic respiratory illness in children. It is characterized by varying levels of airflow limitation on account of airway hyperresponsiveness that causes intermittent episodes of wheeziness, shortness of breath, tightness of the chest, and coughing, particularly in the early morning or at night (6,27). Such airflow impediment that causes asthma flare-up is often reversible either spontaneously or with treatment (16,29). Although asthma in children is a heterogeneous disease that includes different phenotypes, it is believed that genetic predisposition, epigenetic changes, and environmental influences play a combined role in the pathogenesis of asthma. The complex interplay between these factors promotes a strong immune response characterized by the induction of T helper type-2 lymphocytes, which promote the secretion of the pro-inflammatory cytokines, production of immunoglobulin E by B cells, and recruitment of mucosal eosinophils (31).

Increased spasm of the muscles that line the walls of the bronchioles in children with bronchial asthma corresponds to

reduced respiratory function (16). In addition, the narrowed airways cause less air to move in and out of the lungs. This limits the amount of oxygen that enters the bloodstream (13), hence, increases the likelihood of cardiovascular and respiratory diseases. Previous studies demonstrated that a link exists between obesity and asthma incidence and severity (24). Obesity is associated with low-grade systemic inflammation (28). It has been indicated that the increased size of adipocytes causes an increase in the production of adipocytokines, which activate the endothelial cells and promote the accumulation of macrophages in the adipose tissue, which, in turn, triggers a series of inflammatory reactions (8,15). Therefore, the production of these adipocytokines, coupled with the risk of developing asthma, can enhance airway inflammation and change asthma to a more severe and difficult-to-control phenotype.

The Global Initiative for Asthma (GINA) Guidelines described specific criteria for making a diagnosis and setting up possible treatments for patients with asthma. The core goals of asthma treatment are to control symptoms, reduce future risks, and enhance participation in daily living activities (21). Indeed, children with asthma are reported to engage in less physical activity than their healthy peers, maybe because of the fear of experiencing symptoms during or after exercise (9,41). A review of epidemiological studies reported positive associations between low physical activity and childhood asthma and, further, indicated that the less active children were at up to 35% higher risk of developing new-onset of asthma (26). Evidence exists that physical activity programs can reduce

Elnaggar, R. K., Shendy, M. A., & Elfakharany, M. S. (2021). Effect of 8 weeks of incremental aerobic training on inflammatory mediators, cardiorespiratory indices, and functional capacity in obese children with bronchial asthma. *Pediatric Exercise Science*, 33(1), 23–31.

<https://doi.org/10.1123/pes.2020-0076>

Publication types

- > Randomized Controlled Trial
- > Research Support, Non-U.S. Gov't

MeSH terms

- > Adolescent
- > Asthma / rehabilitation*
- > Cardiorespiratory Fitness*
- > Child
- > Exercise*
- > Female
- > Heart Rate
- > Humans
- > Inflammation Mediators
- > Male
- > Oxygen Consumption
- > Pediatric Obesity*
- > Saudi Arabia
- > Walk Test

Substances

- > Inflammation Mediators

Elnaggar is with the Department of Physical Therapy and Health Rehabilitation, College of Applied Medical Sciences, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia. Elnaggar and Elfakharany are with the Department of Physical Therapy for Pediatrics, Faculty of Physical Therapy, Cairo University, Giza, Egypt. Shendy is with the Department of Physical Therapy for Cardiovascular, Respiratory Disorders and Geriatrics, Faculty of Physical Therapy, Cairo University, Giza, Egypt; and College of Medical Rehabilitation Sciences, Taibah University, Medina, Saudi Arabia. Elnaggar (rke_pt2001@yahoo.com) is corresponding author.



Effect of a combined exercise program on physical fitness, lung function, and quality of life in patients with controlled asthma and exercise symptoms: A randomized controlled trial

Verónica Sanz-Santiago MD¹ | Ignacio Díez-Vega PhD² | Elena Santana-Sosa PhD² | Carlos Lopez Nuevo PT² | Tamara Iturriaga Ramirez MSc² | Fernanda Maria Vendrusculo PhD³ | Márcio Vinícius Fagundes Donadio PhD³ | José Ramón Villa Asensi PhD¹ | Margarita Pérez-Ruiz PhD²

¹Pulmonology Unit, Hospital Universitario Infantil Niño Jesús de Madrid, Madrid, Spain

²Faculty of Sport Sciences, Universidad Europea de Madrid, Madrid, Spain

³Laboratory of Pediatric Physical Activity, Infant Center, PUCRS, Porto Alegre, Brazil

Correspondence

Margarita Pérez-Ruiz, Facultad de Ciencias de la Actividad Física, Deporte y Fisioterapia, Universidad Europea de Madrid, Calle Tajo, s/n, Villaviciosa de Odón, 28670 Madrid, España.
Email: margarita.perez@universidadeuropea.es

Funding Information

Conselho Nacional de Desenvolvimento Científico e Tecnológico; VII Convocatoria de Ayudas a la Investigación de la Cátedra Real Madrid Universidad Europea, Grant/Award Number: P2015/16RM; Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, Grant/Award Number: 001; XV Premios Fundación Neumomadrid, Sociedad Española de Neumología Pediátrica (SEN 2015)

Abstract

Background: Asthmatic patients may benefit from exercise training, although the effects of a combined aerobic and resistance training program are still poorly investigated in children and adolescents.

Objective: To analyze the effects of a combined exercise training (resistance and aerobic) program on aerobic fitness, lung function, asthma control and quality of life in a group of mild-moderate asthmatic children with exercise symptoms.

Methods: This was a 12-week randomized controlled trial including children and adolescents diagnosed with mild-moderate asthma and presenting exercise-induced symptoms. The intervention group (IG) performed the exercise training (resistance and aerobic) 3 days/week, for 60 minutes. The control group (CG) followed routine clinical orientations. The main outcomes were cardiorespiratory fitness, muscle strength, lung function, quality of life, asthma control, and functional tests after 3 months of the intervention.

Results: Fifty-three patients (IG = 25 and CG = 28) with a mean age of 11.5 ± 2.6 years were included. No significant differences were found between groups regarding lung function, asthma control, quality of life, and functional tests. Ventilatory equivalent for oxygen consumption at ventilatory threshold ($P = .025$; $\eta_p^2 = 0.083$), peak oxygen consumption ($P = .008$; $\eta_p^2 = 0.116$) and test duration ($P = .014$; $\eta_p^2 = 0.1$) presented greater improvements in the IG. In addition, improvements were observed in leg press ($P < .001$; $\eta_p^2 = 0.36$), hamstring curl ($P = .001$; $\eta_p^2 = 0.217$), high row ($P = .003$; $\eta_p^2 = .167$), low row ($P = .009$; $\eta_p^2 = 0.128$) and quadriceps leg extension ($P = .015$; $\eta_p^2 = 0.108$) in the IG.

Conclusion: Combined exercise training (resistance and aerobic) improved cardiorespiratory fitness and muscle strength in children and adolescents with controlled asthma and exercise symptoms.

KEYWORDS

asthma, exercise, pediatrics, resistance training

Sanz-Santiago, V., Díez-Vega, I., Santana-Sosa, E., Lopez Nuevo, C., Iturriaga Ramirez, T., Vendrusculo, F. M., Donadio, M. V. F., Villa Asensi, J. R., & Pérez-Ruiz, M. (2020). Effect of a combined exercise program on physical fitness, lung function, and quality of life in patients with controlled asthma and exercise symptoms: A randomized controlled trial. *Pediatric Pulmonology*, 55(7), 1608–1616. <https://doi.org/10.1002/ppul.24798>

Publication types

- > Randomized Controlled Trial
- > Research Support, Non-U.S. Gov't

MeSH terms

- > Adolescent
- > Asthma / physiopathology
- > Asthma / therapy*
- > Child
- > Exercise / physiology
- > Exercise Therapy*
- > Female
- > Humans
- > Male
- > Muscle Strength
- > Physical Fitness / physiology
- > Quality of Life
- > Respiratory Function Tests



How do PubMed scholarly peer-reviewed research articles provide original data to inform you on how exercise and training affect a specific pediatric clinical condition or disease?



Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

<https://researchguides.library.brocku.ca/styleguides>

<https://zbib.org/>

<https://www.zotero.org/>



zotero Web Library Groups Documentation Forums Get Involved igordon ▾ [Upgrade Storage](#)

Left Sidebar (Library Structure):

- HLSC 2P00
- HLSC 3P80
- HLSC Project
 - huma
- indigenous chemistry
- Inman
- jena
- Joyce
- kacey
- kaitlyn
- Kendra
- Kieva
 - KINE 1P93
 - KINE 2P91
 - KINE 4P84 asthma**
 - KINE hon students
 - KINE stuff
- Lauren
- Lauren
 - madeleine
 - marco
 - Maria
- *Asthma
 - *Asthma/pp [Physiopathology]
 - *Asthma/rh [Rehabilitation]
 - *Asthma/th [Therapy]

Main Table:

Title	Creator	Date	
Can physical exercise assist in controlling and reducing the severity of exercise-induced b...	Souza Silva et al.	2023-12-04	
Comparison of physical fitness between healthy and mild-to-moderate asthmatic childre...	Sanz-Santiago et al.	2021	
Determinants of exercise capacity in children and adolescents with severe therapy-resista...	Schindel et al.	2022	
Effect of 8 Weeks of Incremental Aerobic Training on Inflammatory Mediators, Cardioresp...	Elnaggar et al.	2021	
Effect of exercise rehabilitation on exercise capacity and quality of life in children with br...	Liu et al.	2021	
Effect of physical activity on asthma control in schoolchildren.	Santos et al.	2020	
Effects of physical conditioning on children and adolescents with asthma.	Welsh et al.	2005	
Effects of physical exercise on quality of life, exercise capacity and pulmonary function in ...	Basaran et al.	2006-03	
Effects of physical therapy on lung function in children with asthma: a systematic review ...	Zhang et al.	2021	
Effects of physical training in asthma: a systematic review.	Ram et al.	2000-06	
Exercise rehabilitation in pediatric asthma: A systematicreview and network meta-analysis.	Jiang et al.	2022-10-12	
Exercise training in children with asthma: a systematic review.	Wanrooij et al.	2014-03-23	
Exercise training on disease control and quality of life in asthmatic children.	Fanelli et al.	2007-09	
Exercise-induced dyspnea in children and adolescents: if not asthma then what?	Abu-Hasan et al.	2005-03	
Perceived exercise limitation in asthma: The role of disease severity, overweight, and phy...	Westergren et al.	2017-02	
Physical activity and asthma: a systematic review and meta-analysis.	Eijkemans et al.	2012-12-20	
Physical activity and exercise in asthma: relevance to etiology and treatment.	Lucas and Platts-Mills	2005-05	
Physical activity and quality of life in children with well-controlled asthma.	Peftoulidou et al.	2023-05	
Physical activity experiences of children and adolescents with asthma: a qualitative syste...	Westergren et al.	2020	
Physical therapy and lung function in children with asthma: is it helpful?.	El-Khuffash et al.	2021	
Responses to Physical Activity Among Children and Youths with Exercise-Induced ASTHM...	Barfield and Michael	2002	
The beneficial effects of physical exercise on antioxidant status in asthmatic children.	Onur et al.	2011-01-15	

Right Sidebar (Info Panel):

Item Type Journal Article

Title Comparison of physical fitness between healthy and mild-to-moderate asthmatic children with exercise symptoms: A cross-sectional study.

Author Sanz-Santiago, Veronica

Author Diez-Vega, Ignacio

Author Donadio, Marcio Vinici...

Author Schiwe, Daniele

Author Lopez-Nuevo, Carlos

Author Vendrusculo, Fernanda M

Author Santana-Sosa, Elena

Author Burgos, Silvia

Author Escribano-Ceruelo, Eva

Author Villa-Asensi, Jose R

Author Perez-Ruiz, Margarita

Publication Pediatric pulmonology

Volume 56

Issue 8

Pages 2512-2521

Date 2021

Series

Series Title

Series Text

Journal Abbr Pediatr Pulmonol

Language

Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- [Where, how and when to get help](#)

Where can I get help?

Brock Library KINE Research Guide

<https://researchguides.library.brocku.ca/KINE>

Email the Library

libhelp@brocku.ca

Ask Us Chat service

<https://brocku.ca/library/chat/>



Book a Consultation

<https://calendar.library.brocku.ca/appointments/researchconsultation>

Make an Appointment Research Consultation

Your Librarian can help you:

- use the best search tools for your assignments
- find information sources on your specific topic
- develop effective research strategies
- become a confident and independent researcher

1. Select One

▼ Librarian

Research Consultation (30 minutes) ▼

☐ Justine Cotton

☒ Ian Gordon (he/him)

☐ Elizabeth Yates

☐ Kimberly Ash









2. Select Date:

🕒

Jan ▼ 2024

🕒

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

3. Select Time:

Monday, January 15, 2024

Time Zone: Eastern Time - US & Canada ([change](#))

9:03am

9:33am

10:03am

12:03pm

12:33pm

1:03pm

1:33pm

2:03pm

2:33pm

3:03pm

3:33pm

Continue

<https://researchguides.library.brocku.ca/KINE>

[Library](#) / [Research Guides](#) / [Kinesiology](#) / [Welcome](#)

Kinesiology

WELCOME

ARTICLES

BOOKS

GREY LITERATURE

DATA

BORROW FROM OTHER LIBRARIES

ADDITIONAL COURSE GUIDES

Need Help?



Contact us at libhelp@brocku.ca or find more library help on our [Research Support](#) page.

Kinesiology

What is this guide for?

This guide has been designed as a general program guide and is curated by [Brock librarians](#). It features links to most often used resources such as databases for books, peer-reviewed journal articles, theses, dissertations, open educational resources (OEDs), systematic reviews, and more. Use the tabs on the left to navigate through the web page.

Selective course-related guides are provided when appropriate every term.

KINE 1P93 Library Seminar Fall 2023 ppt [slides](#) (PDF) and [video](#).

KINE Stuff Fall 2023 ppt [slides](#) (PDF)

KINE Honors Students Library Seminar Fall 2023 ppt [slides](#) (PDF)

KINE 4P84 Library Library Seminar Winter 2024 ppt [slides](#) (PDF) and [video](#) (YouTube, 32:49)

[PubMed: Building a Search](#) (2022, John Hopkins Welch Medical Library, YouTube, 17:13)

[How to Recognize an Original Research Article](#) (2020, Collier Library, PowToon, YouTube, 3:27)

[Primary Research in PubMed](#) (2021, Emily Metcalf, Texas A&M University-Corpus Christi Library, YouTube, 4:15)





Ian Gordon

Teaching & Learning Librarian
igordon@brocku.ca